

Buccaneer



AEROGUIDE **5**

HS Buccaneer S Mk 2

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Hawker Siddeley Buccaneer S Mk 2

Adapting aircraft originally designed for use from land bases to enable them to operate from carriers at sea has been a common expedient throughout the history of military aviation, particularly where equipment for the Royal Navy has been concerned, but the acquisition by land-based air forces of machines produced specifically for deployment from flight decks has been a much less frequent occurrence. In recent years, however, a number of aircraft have made this transition with remarkable success, perhaps the best-known example being the McDonnell Douglas F-4 Phantom. One British aircraft to have made the move, with equal success if not in the same numbers, has been the Royal Navy Phantom's erstwhile hangar-mate, the Buccaneer.

Whilst the content of AEROGUIDE 5 does not ignore the naval connection, it concentrates on Buccaneers that are currently in British service – those in the Royal Air Force – and in fact includes illustrations of aircraft from both remaining front-line squadrons and the single Operational Conversion Unit; some of the RAF Buccaneers are of course former Royal Navy aircraft. The majority of the photographs were taken at Lossiemouth in February 1984, and aircraft from Nos 12 and 208 Sqns were at the time showing evidence of their recent deployment to Cyprus in response to the crisis in the Lebanon: one particularly interesting feature, not widely reported, was the deletion of the starboard underwing serial number in order to eliminate the 'V' effect of the paired serials which could have formed an aiming point for hostile ground-based missile batteries. Most of the photos depicting No 237 OCU Buccaneers were taken at Honington in August 1983.

Photographic facilities for the purposes of this book were kindly granted by the Officers Commanding, RAF Honington and RAF Lossiemouth, and special thanks go to the Officers Commanding the units whose aircraft are illustrated. Chris Shepherd and Tony Talbot, RAF Strike Command HQ, gave invaluable help in getting the project underway, and the publishers are also grateful to Sqn Ldr Bill Watford at RAF Honington and to Flt Lt Cynthia Blenkinsop at RAF Lossiemouth for their tremendous 'on site' assistance. For help with photographs and technical information thanks are due to Eric Barker, British Aerospace Publicity Manager at Brough; Brian Petty of the Martin-Baker Aircraft Co Ltd; the Public Relations Department, RNAS Yeovilton; Len Lovell, Fleet Air Arm Museum; S/Sgt Ferreira, South African Defence Attaché, London; Dick Ward; Flt Lt Andy Turnbull and Chf Tech Brian Armstrong, No 208 Sqn; and Sqn Ldr Rudd and Fg Off Mike Foreman, No 12 Sqn. Uncredited photographs are copyright Linewrights Ltd.

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Front cover illustration: A Buccaneer S Mk 2B of No 208 Sqn, RAF Lossiemouth, February 1984

Back cover plate: A Buccaneer S Mk 2 of No 801 NAS, HMS *Victorious*, 1966

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INTRODUCTION

Although its basic design dates back to the early 1950s, and notwithstanding its recent replacement in RAF Germany by Tornados (see AEROGUIDE 4), the Buccaneer is still very much a part of the Royal Air Force's front-line inventory; moreover, it is still, in 1984, an extremely capable aircraft.

There are several reasons why this is so. The Buccaneer was produced specifically as a low-level strike aircraft in an era when the high-altitude manned bomber reigned supreme; today, when RAF attack doctrine is all about penetration beneath the sweep of enquiring radar beams and thus providing a retaliatory missile defence with minimal detection, range and tracking data on which to react, its concept is even more relevant.

A second factor, which is explained partly by the requirement to operate in turbulent air at low level, is the aircraft's immense strength. Features such as wing panels machined from solid metal are complemented by the extremely rugged undercarriage, the

latter a product of the need to embark the aircraft on board carriers and of the 'controlled crashes' that flight-deck touchdowns by conventional aircraft invariably imply.

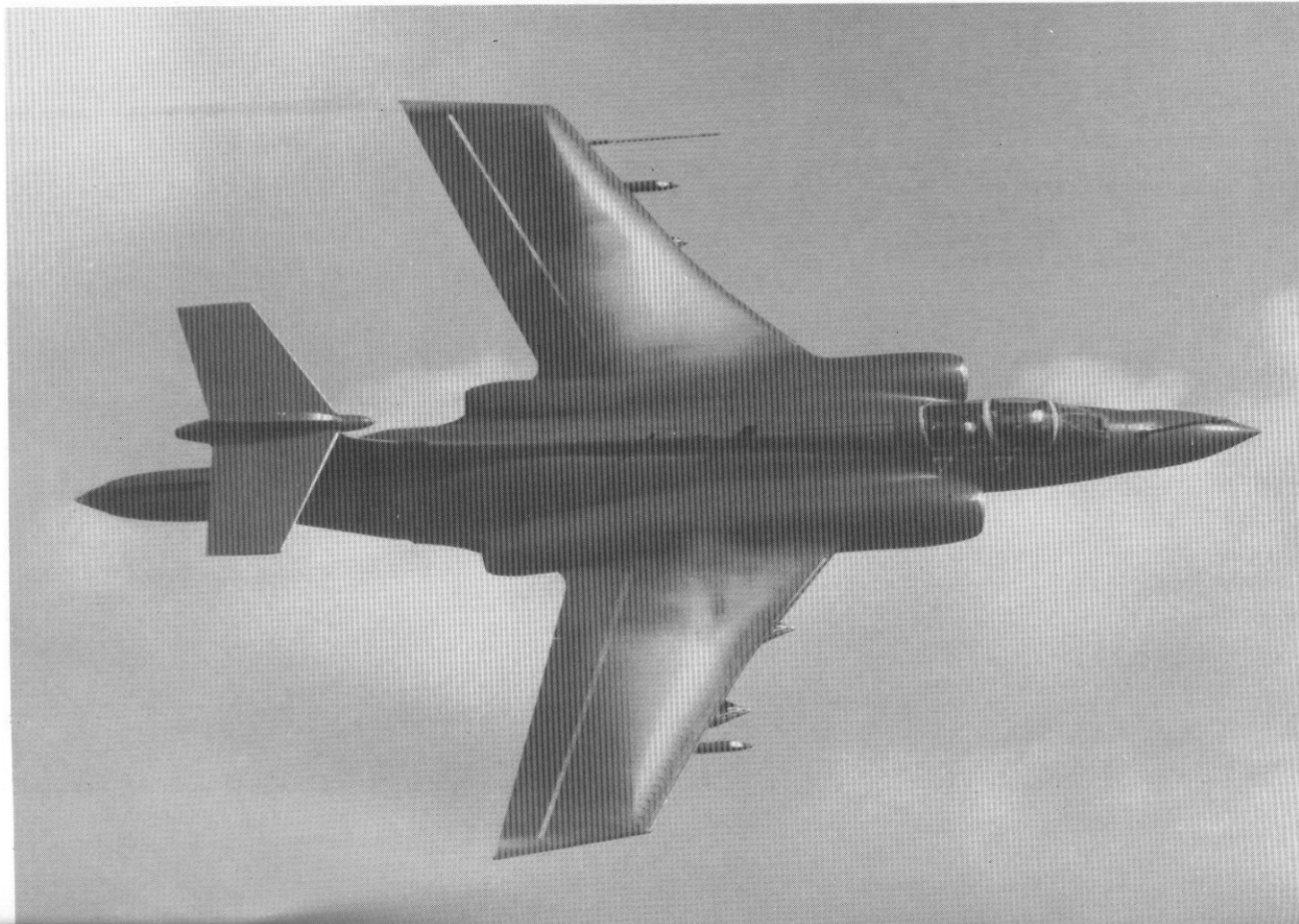
A third reason for the Buccaneer's longevity is the aircraft's performance. For example, thanks to its very economical Spey turbofans, it has a quoted range well in excess of that of any comparable aircraft, whilst at low level few can even now match it for speed. Its achievements in this respect approach the proportions of legend, one particularly vivid illustration being the recent experience of No 12 Sqn whilst taking part in joint exercises overseas, when 'defending' pilots, flying some of the West's latest and most potent Mach 2+ fighters, descended to 200ft to search for and intercept the 'attacking' Buccaneers and were somewhat piqued to discover the latter overtaking 70ft beneath them.

ADVANCED DESIGN

The Buccaneer was originally designed

as a carrier-borne strike bomber capable of dealing with heavy surface ships and first flew in prototype form in April 1958. Pre-production machines were designated NA.39 (as was the requirement for the aircraft issued in 1952 by the Admiralty), and these and the first batch of production Buccaneers (S Mk 1) were powered by two de Havilland Gyron Junior turbojets; however, it was not until the introduction of the Rolls-Royce Spey (which required, most obviously, new, considerably enlarged main intakes) that the S Mk 2 was able to combine greatly increased thrust and significantly improved fuel efficiency with Blackburn's futuristic high-technology airframe and permit the design to realise its full potential.

Below: Shock wave haze masks the wing roundels as a No 809 NAS Buccaneer S Mk 2 makes a high-speed, low-level pass, October 1978. Rocket pods are fitted below the wings. HMS Ark Royal





Blackburn (now part of British Aerospace Weybridge Division) incorporated a number of very advanced features in the Buccaneer. Most apparent among these to the casual observer is the application of the 'area rule' principle, wherein airframe drag is substantially decreased by 'smoothing' the airflow over it, most notably behind the wing trailing edge, where in more conventional designs there is a sudden loss of overall cross-sectional area. The Buccaneer's prominent fuselage bulge in this region provides the necessary compensation. A further aerodynamic feature is the rotating bomb bay, its pivoting door allowing high-speed weapons release with little drag penalty. A rotatable door bulged to incorporate a 425gal fuel tank was developed for RAF Buccaneers,

increasing range still further with no detriment to aerodynamics or weapons capacity. Another ingenious system is that whereby, during take-off and landing, air ducted from the engines is blown at high speed via minute leading-edge slits across the tops of the wings and tailplane; this has the effect of reducing the density of the air above the flying surfaces and thus provides additional lift, thereby lowering the stalling speed (or, put another way, enabling the wings to perform as though much larger in area than they actually are). The importance of this for a carrier-based aircraft is not difficult to appreciate, and its benefits for aircraft operating from fixed runways are also useful – especially for the Buccaneer, which has no braking parachute.

SENIOR SERVICE

In March 1961 the Buccaneer joined the Royal Navy, a special Intensive Flying Trials Unit, No 700Z Flight, being established at Lossiemouth to evaluate the aircraft. The first fully equipped front-line unit, No 801 Naval Air Squadron, was operational in 1962 and in the following year was taken to sea aboard *Ark Royal*. By the spring of 1964 two further S Mk 1 squadrons, Nos 800 and 809, were in being, the former on board *Eagle*. A year later the first S Mk 2 unit, No 700N Flight, was conducting trials with the re-engined Buccaneer, and this variant would eventually re-equip all the S Mk 1 squadrons plus No 803 NAS, the carrier *Victorious* becoming the third vessel to embark the type. No 809 proved to be the last squadron to operate





Royal Navy Buccaneers, relinquishing its aircraft to the RAF late in 1978.

Early in 1963 an order for sixteen Buccaneers had been received from the South African Air Force. Designated Mk 50, these aircraft were broadly similar to the S Mk 2 but were fitted with a pair of Bristol Siddeley BS.605 rocket motors behind the bomb bay to provide additional thrust for take-off. Deliveries were completed by the end of 1966, the aircraft equipping No 24 Sqn; this unit is still operational, although, reportedly, several machines have been lost through various causes.

Opposite page top: Two development NA.39s fly in company. The aircraft nearest the camera is the fourth prototype, fitted with the production, radar-carrying nose. *British Aerospace*

Opposite page bottom: The final pre-production Buccaneer, XK536, to S Mk 1 standard, conducts launch trials aboard *Hermes*, May 1962. *Fleet Air Arm Museum*

Top: A No 809 NAS Buccaneer S Mk 2 overshoots the wires on board *Hermes*, mid-1966. *Fleet Air Arm Museum*

Above: An S Mk 2 departs *Ark Royal*, October 1978. *HMS Ark Royal*

Right: Two Royal Navy S Mk 2s in close formation. *Richard L Ward*

BUCCS FOR THE RAF

Forty-three new-build Buccaneer S Mk 2s were ordered for the Royal Air Force, the first examples joining the service in 1970. There seems no doubt that the former Royal Navy machines would have been transferred to RAF control in any event following the phasing out of the Navy's fleet carriers, but the requirement for these factory-fresh examples can be traced directly to the cancellation in 1966 of the magnificent TSR.2 strike bomber and the subsequent abandonment of its proposed successor, the F-111K.

Buccaneers have served with Nos

12, XV, 16, 208 and 216 Squadrons, plus No 237 Operational Conversion Unit. The RAF Germany-based units and No 216 Sqn have now disbanded, leaving Nos 12 and 208 (equipped primarily for the anti-ship role) at Lossiemouth – now under RAF authority – and No 237 OCU, which at the time of writing was scheduled to move to that station from Honington. It is anticipated that these units will continue to operate Buccaneers for a number of years yet, and that these popular and very effective – some say irreplaceable – aircraft will thus see out well over thirty years of front-line service.





Top: No 12 Sqn Buccaneer S Mk 2s lined up at RAF Honington, summer 1970. They show the original RAF scheme of Dark Sea Grey, Dark Green

and Light Aircraft Grey, in glossy finish.

Above: A No 16 Sqn aircraft, at Laarbruch, 1974. *Richard L Ward*



Below: A Buccaneer S Mk 50 of the South African Air Force, carrying four Nord AS.30 air-to-surface missiles, on a pre-delivery flight. *British Aerospace*



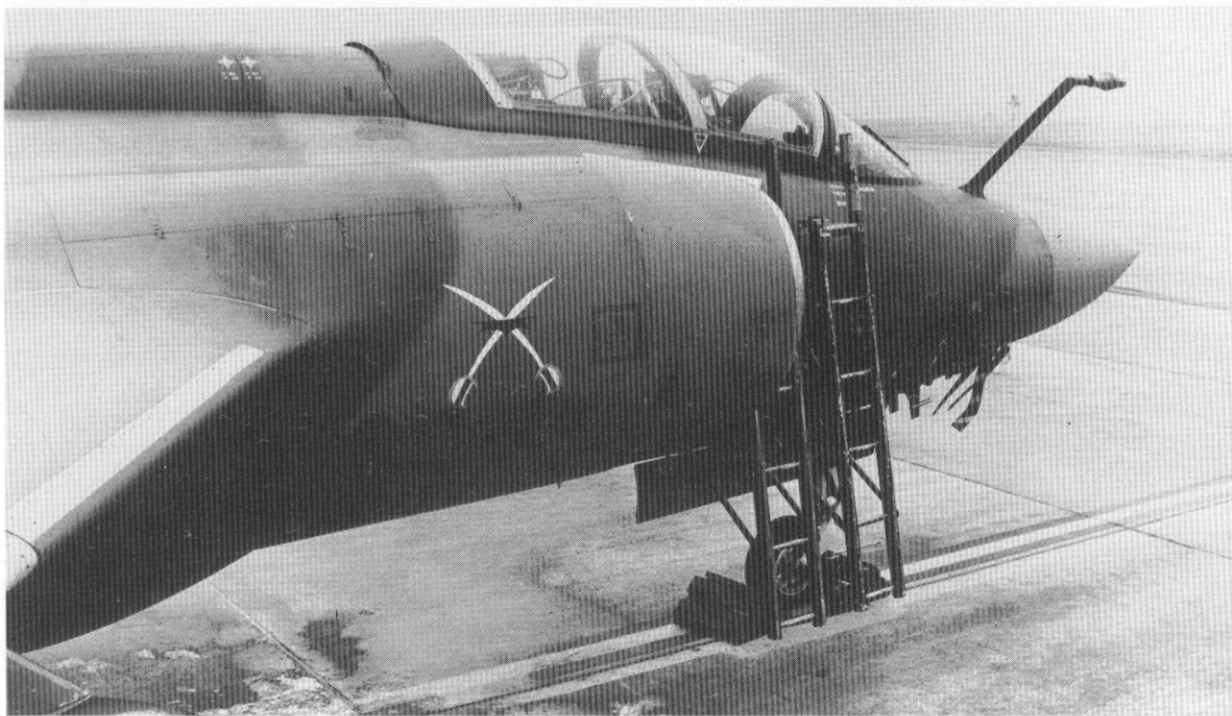
AIRFRAME

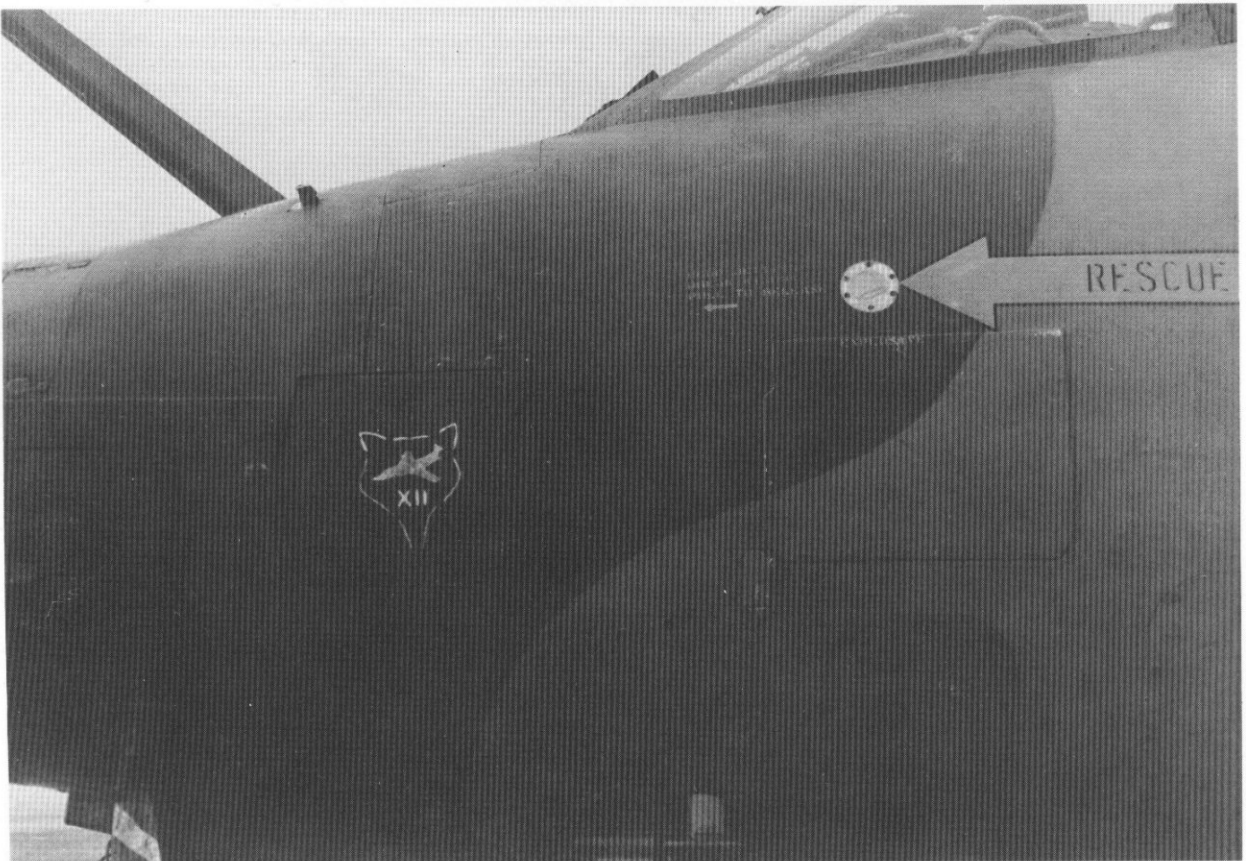
Below: Forward fuselage of a Buccaneer S Mk 2A showing the characteristic inflight-refuelling probe, offset to starboard. The crossed swords

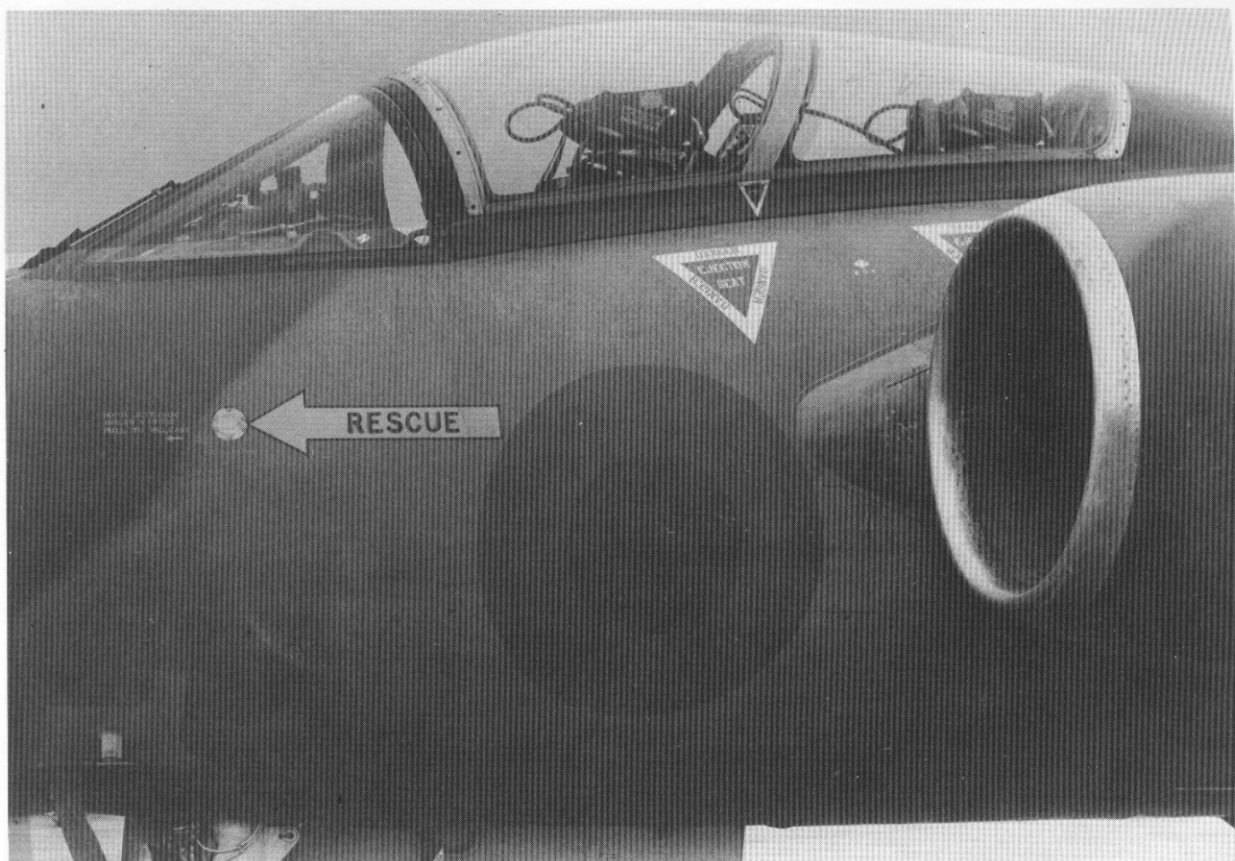
and mortar board insignia (white, yellow and black) of No 237 Operational Conversion Unit is prominent.

Bottom: Buccaneer radome hinges to

port, the break line just aft of the refuelling probe. Note brake pressure gauges below the pale blue and yellow No 208 Sqn insignia.







Opposite page top: Nose of S Mk 2B XV332. The inflight-refuelling probe is scaled off in degrees from 0 to 7.

Opposite page bottom: XV154/'A' of No 237 OCU bears evidence of a visit

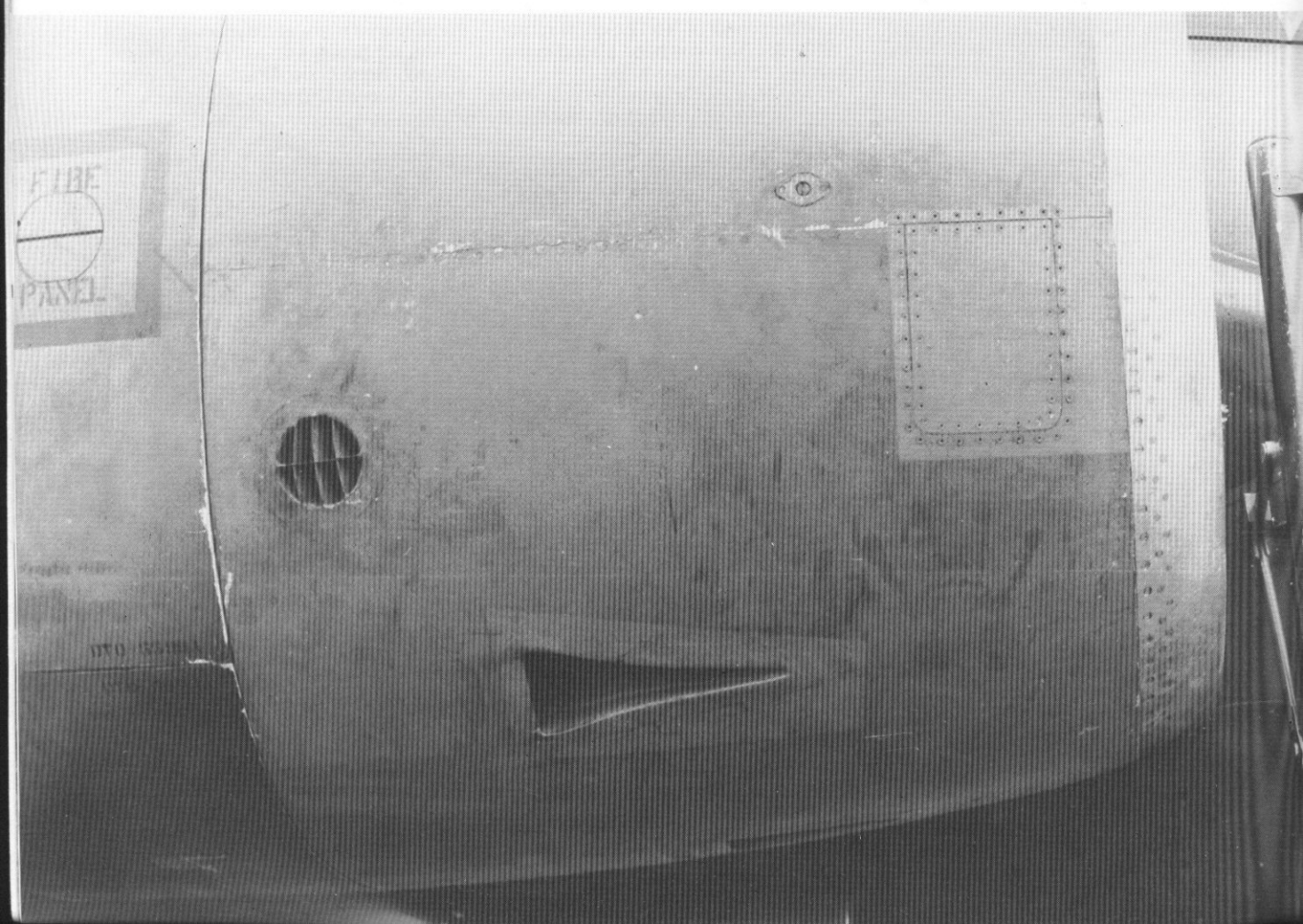
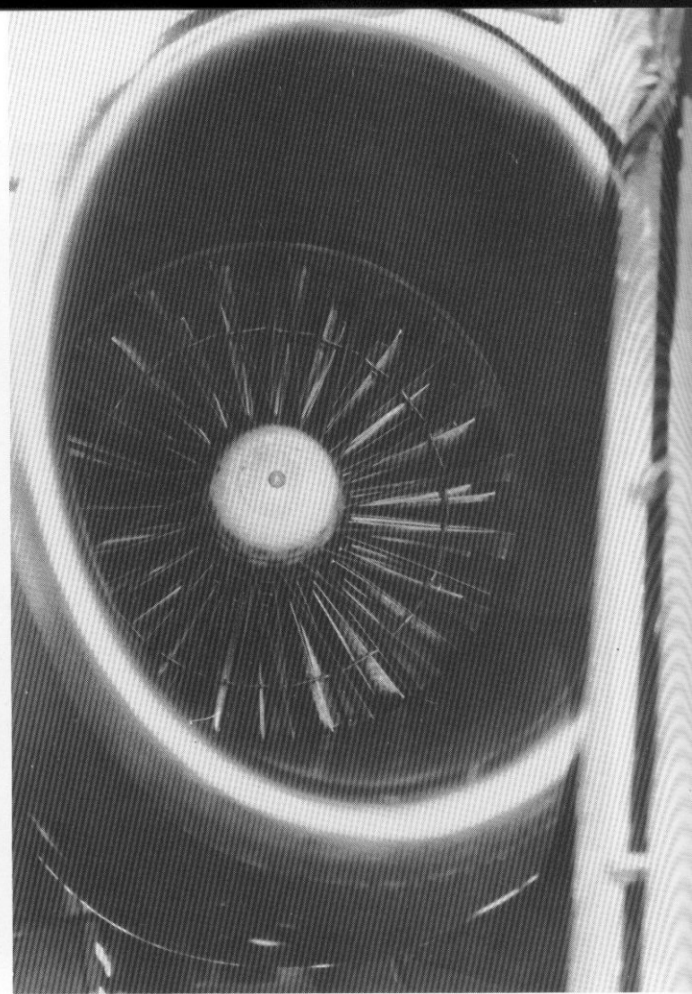
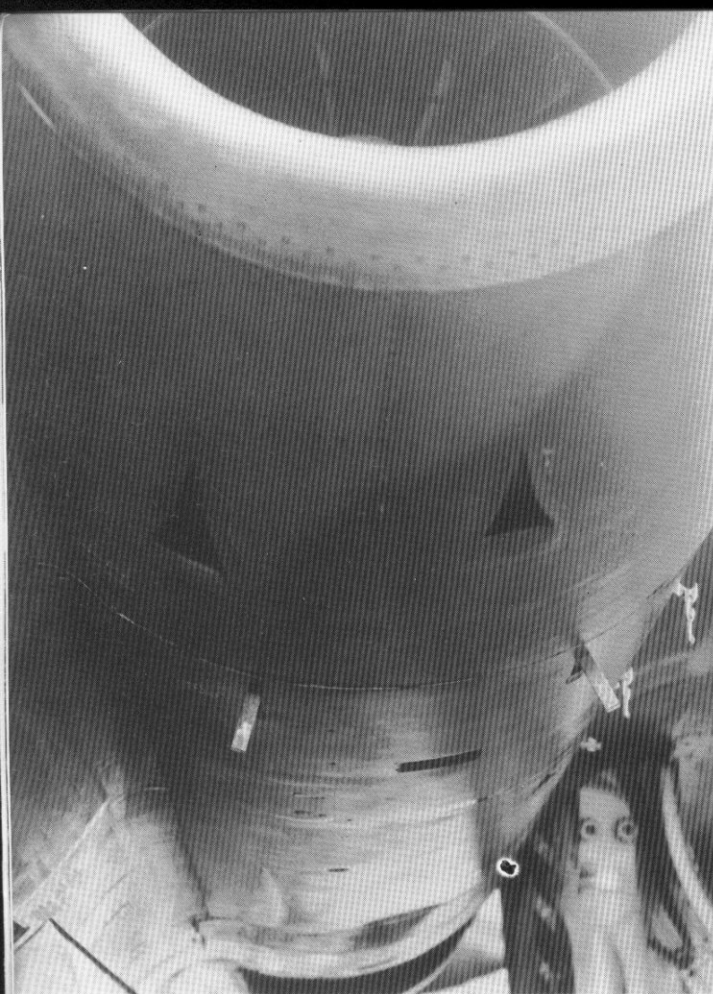
from personnel of No 12 Sqn, summer 1983. The 'zap' has been placed in the centre of the radome hinge.

Above: Port intake area. The prominent fairing inboard of the intake – apparently

more than a mere aerodynamic feature – was not present on early S Mk 2s.

Below: Nose undersurfaces, showing twin antennas and (now redundant) camera port.







Opposite page top left: Lower contours of port intake, showing NACA-type inlets. Latches for lower access door to engine are open.

Opposite page top right: Compressor blades of the starboard Spey engine.

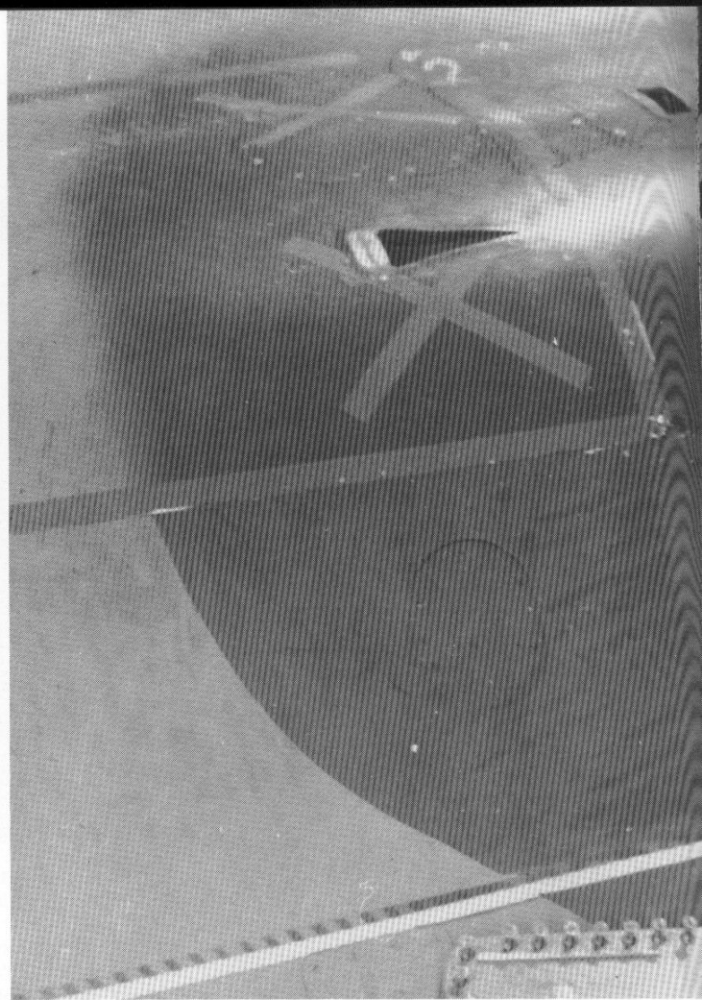
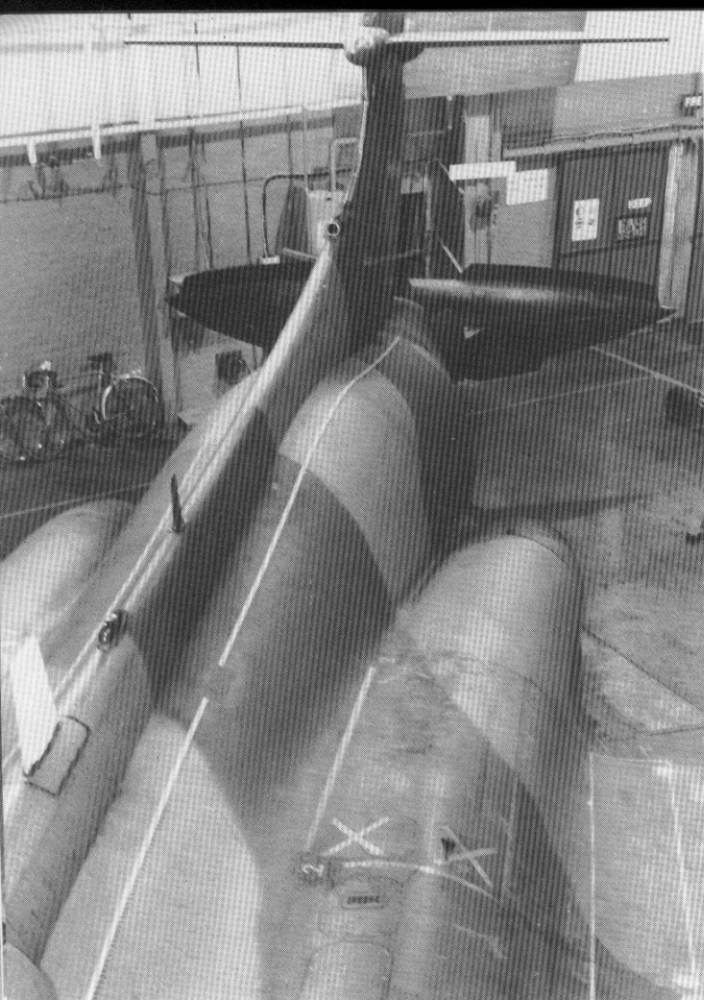
Opposite page bottom: Starboard main intake detail. Intake rim is natural stainless steel.

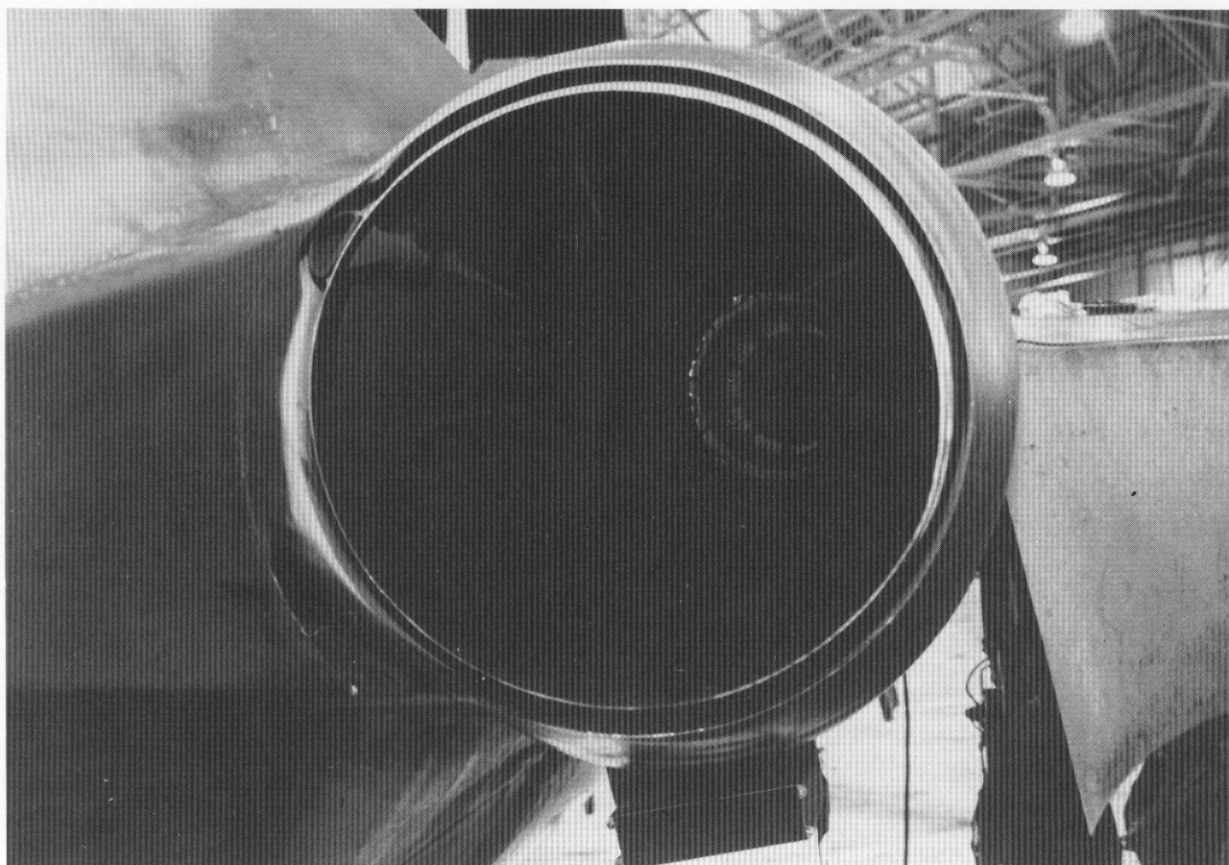
Above: Inboard wing section, showing stainless steel leading edges associated with the aircraft's blown air system. The

wing hinge panels are absent – it is common practice for Buccaneers to fly in this condition.

Below: View along top of starboard intake emphasises smooth flowing curves of the airframe.







Opposite page top left: Uppersurface view of S Mk 2B XX900, showing walkway markings.

Opposite page top right: Top surface of XX900's starboard intake duct shows

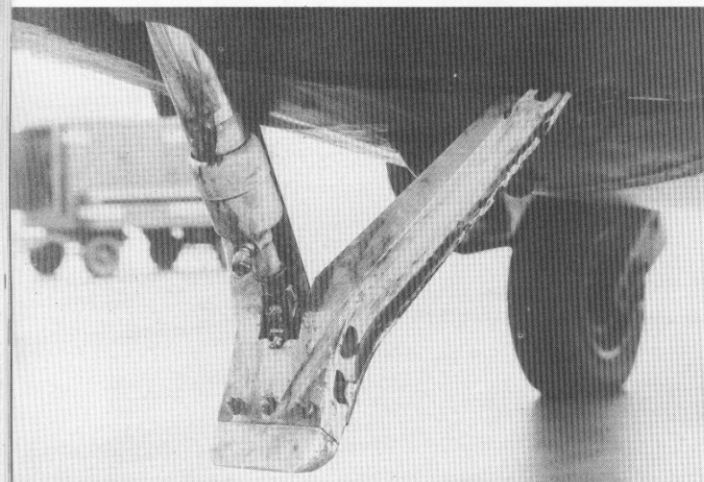
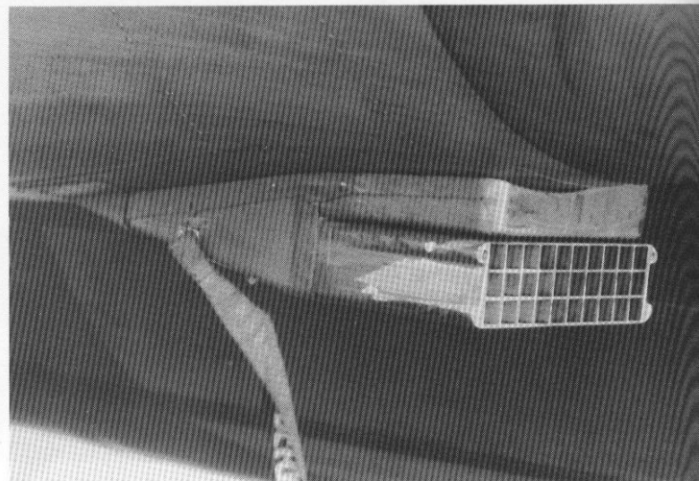
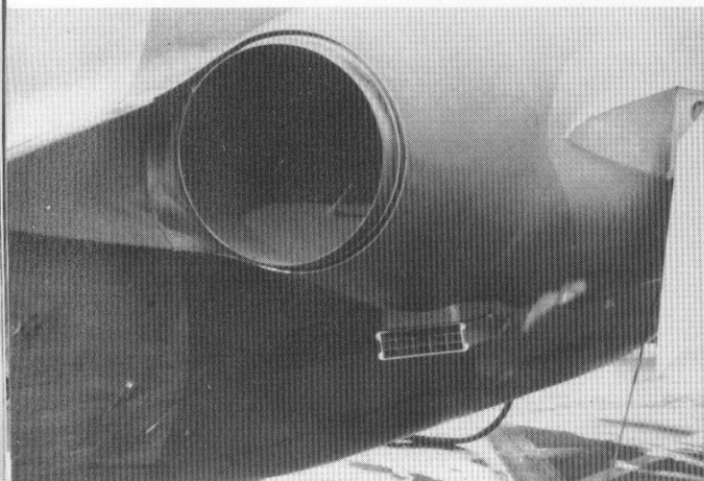
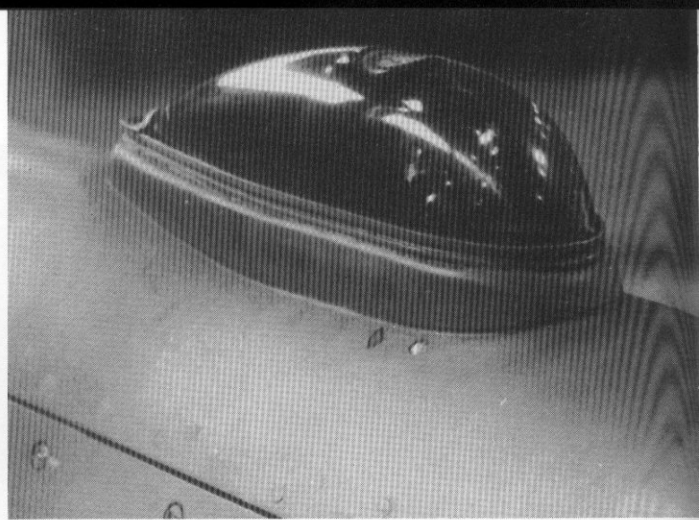
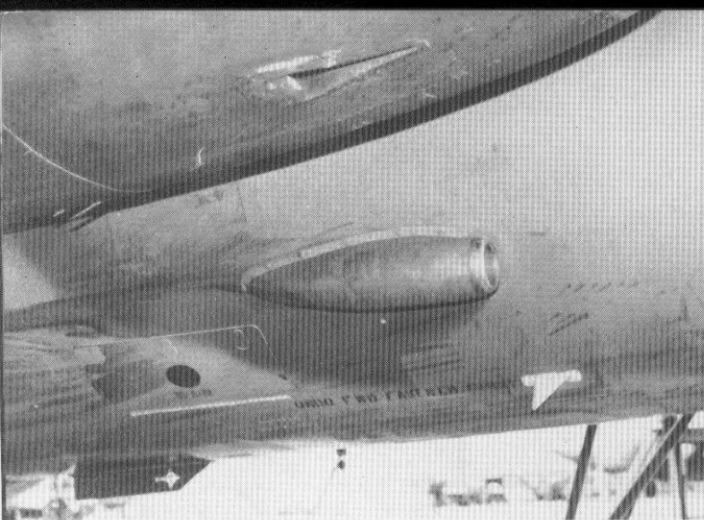
paintwork applied by both spray and roller. Striping is yellow and red.

Opposite page bottom: Lower fuselage details: bulged bomb bay and retractable tail bumper.

Above: Jet pipe detail – note 'breather' at top left of rim.

Below: Rear fuselage. Serial numbers rapidly become obscured by exhaust staining.





Top left: Detail of ram air cooling intake to accessories bay, situated beneath starboard main intake.

Top right: Anti-collision lamp on dorsal fuselage fairing.

Above left: Starboard tailpipe of XV332 (No 208 Sqn), showing position of chaff dispenser.

Above right: Flare dispenser fitted to port tailpipe of the same machine. Finish is natural metal.

Left: Close-up of tail bumper, viewed from starboard.

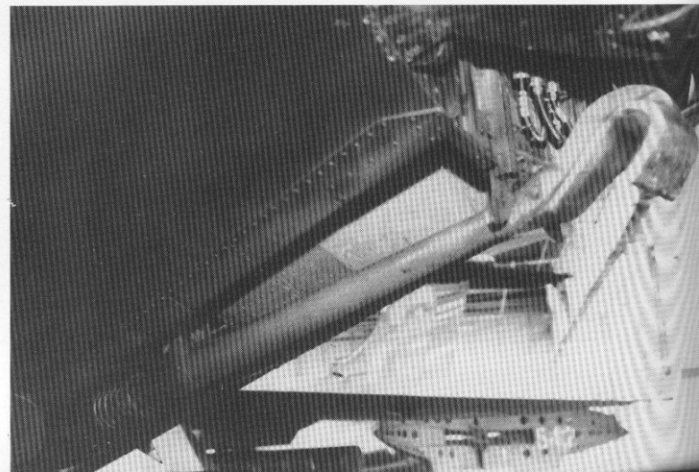
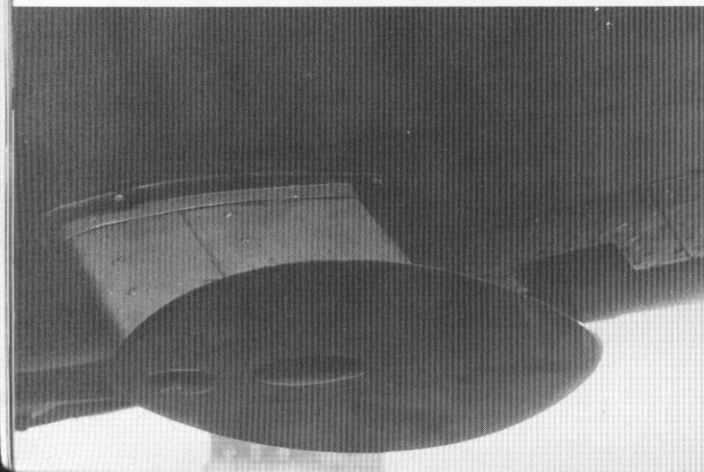
Below left: Main fuel drain, on port side of rear fuselage.

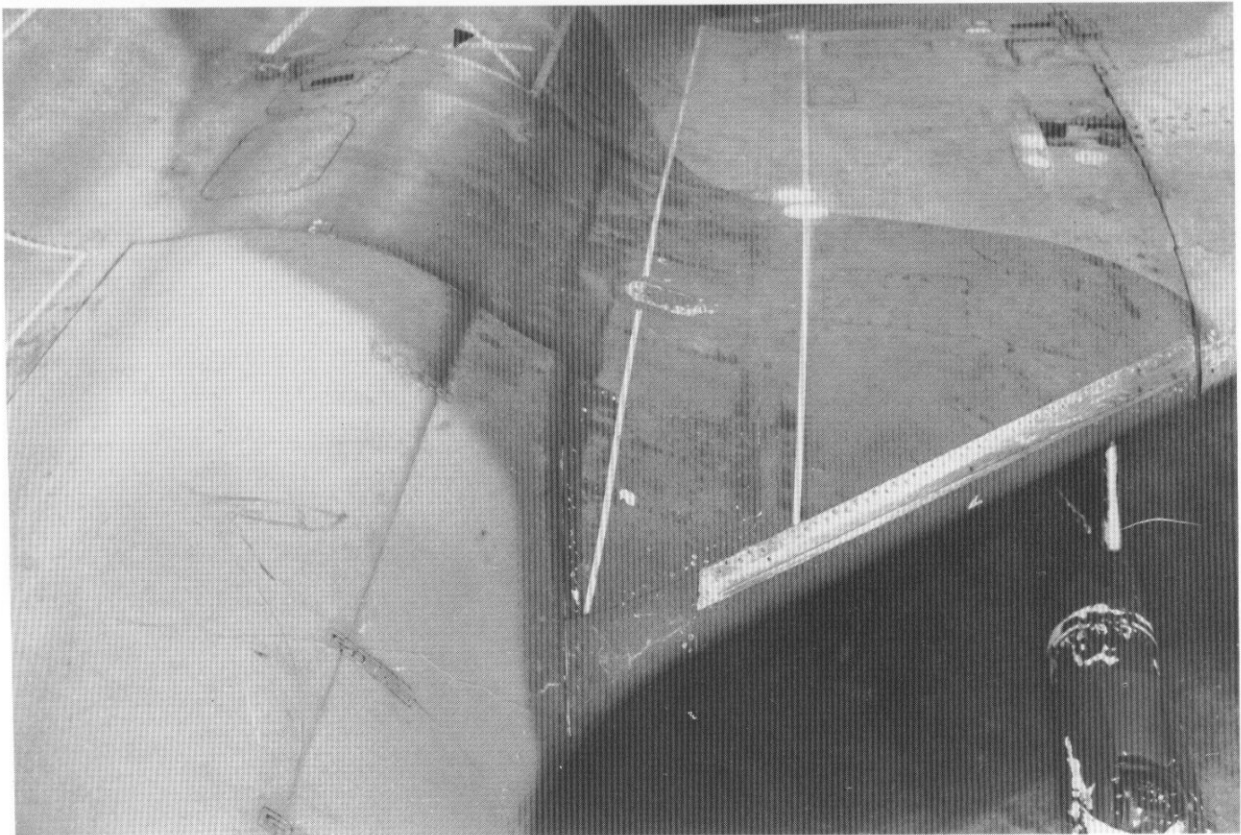
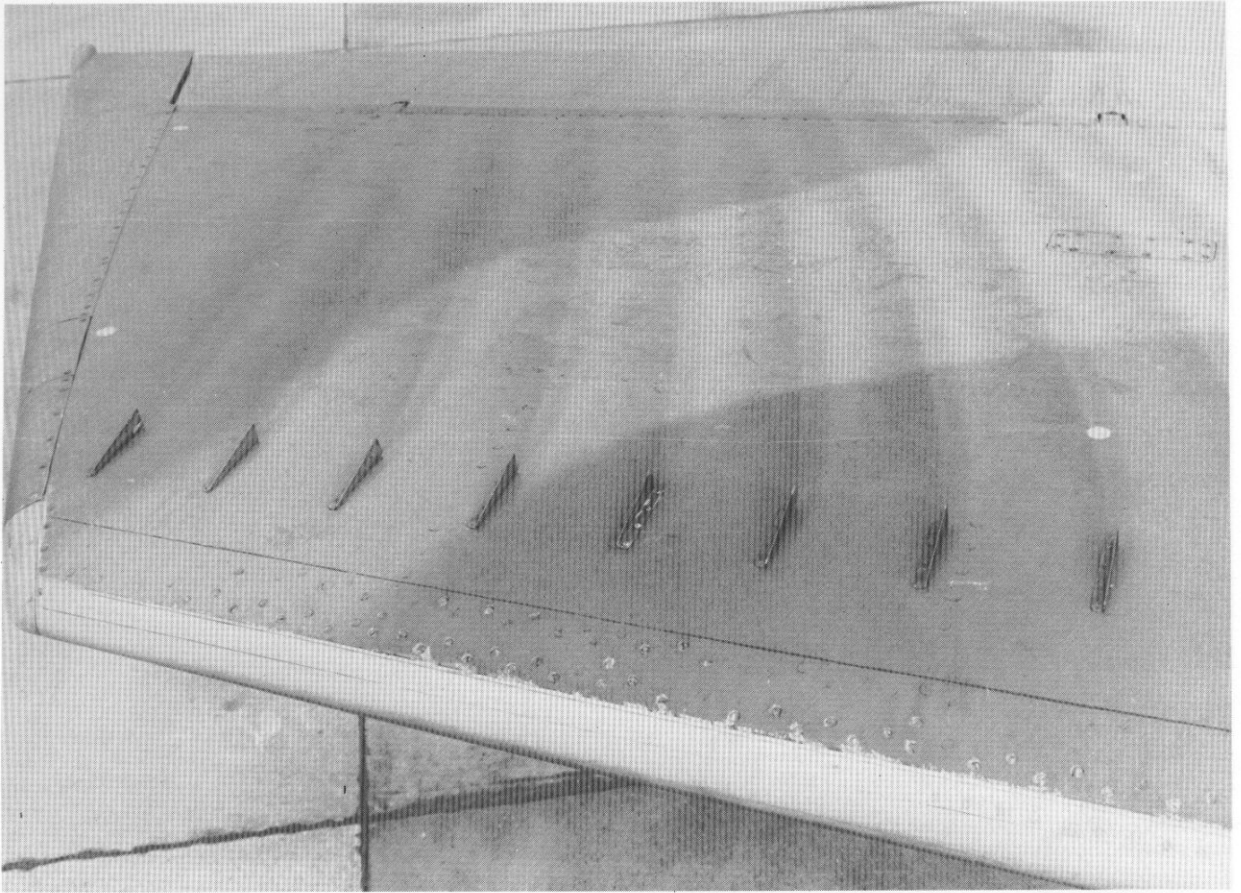
Below right: Arrestor hook; note that it is fitted semi-recessed and is of natural metal finish.

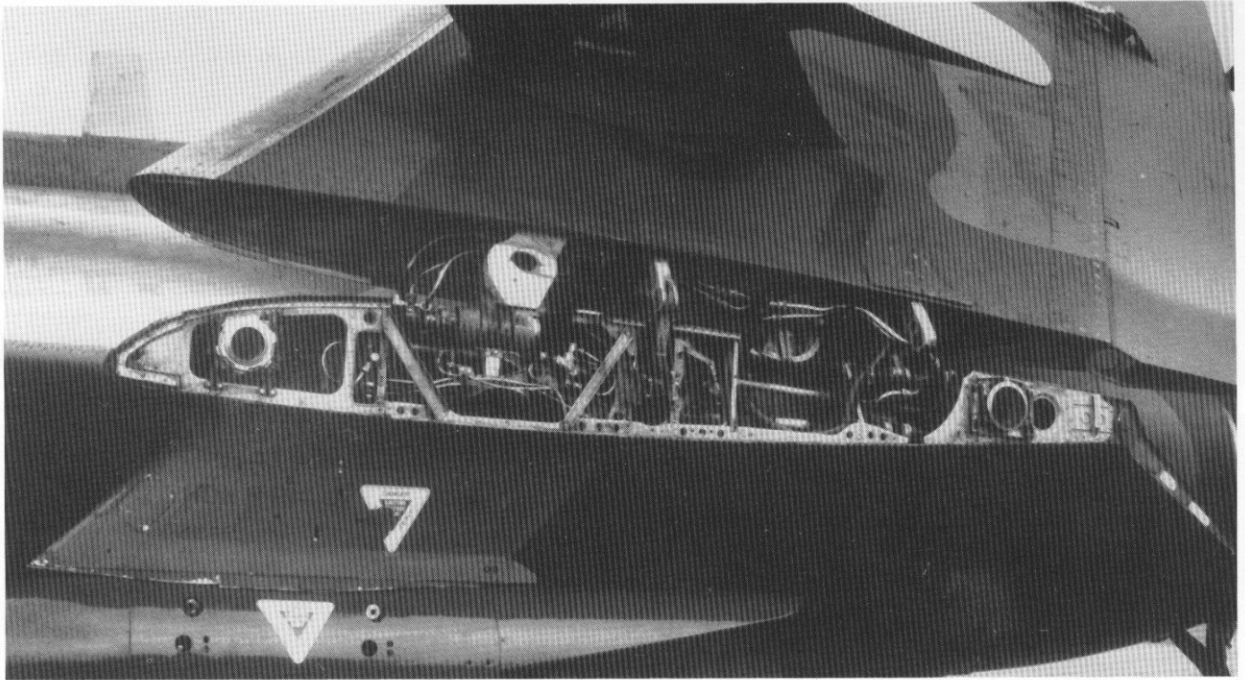
Opposite page top: Outer starboard wing, showing heavy staining caused by airflow across the vortex generators.

Visible along the leading edge are the slots through which air is blown during low-speed manoeuvres.

Opposite page bottom: View of inboard section of port wing. Visible here are the latches for the hinged inspection panel providing access to the port engine, whilst the inboard wing pylon carries a Pave Spike laser target designator. Again, note both 'hard' and 'soft' camouflage edges.







Above: Wing hinge. Mandatory for carrier stowage, wing folding is also of considerable benefit in RAF hangars. Note ducts forward and aft for air blowing boundary layer system.

Below left: Wing root detail adjacent to flap, showing how tailpipe skin overlaps

flap along junction.

Below right: Aileron actuator.

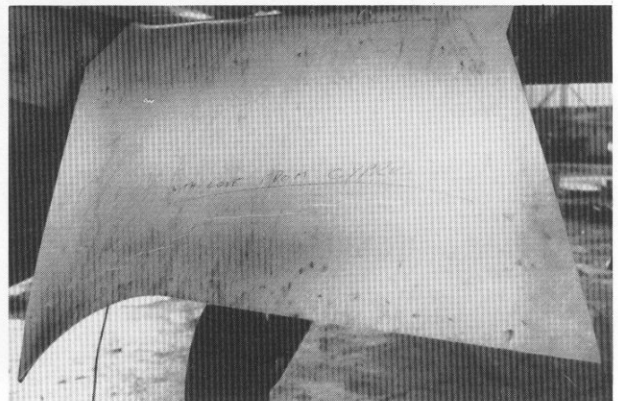
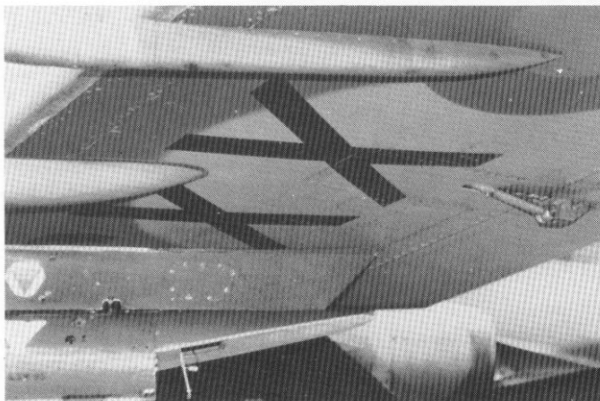
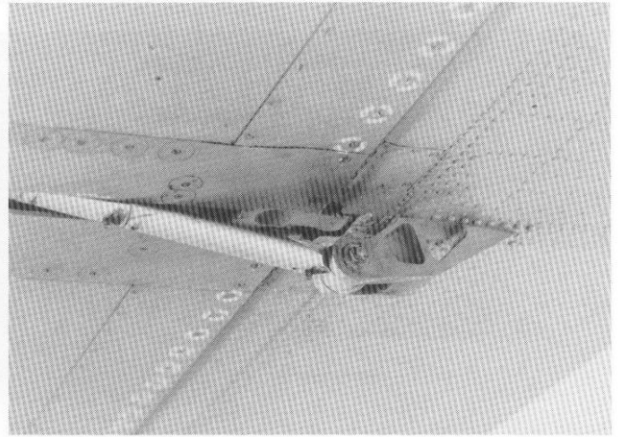
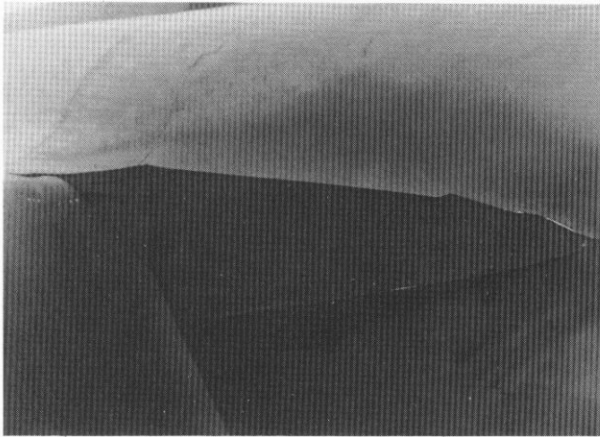
Bottom left: Underside of port wing, showing pitot tube and ARI.18228 radar warning receiver (RWR) fairings.

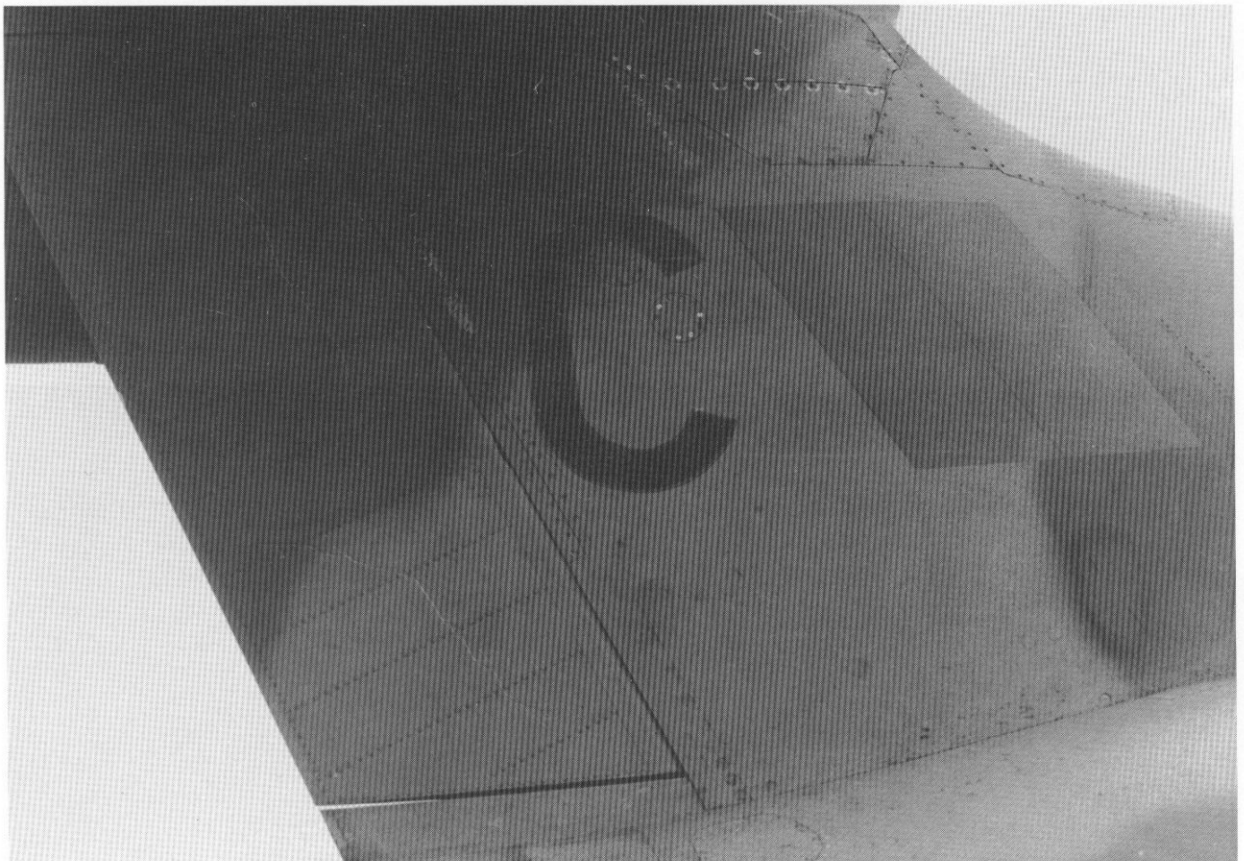
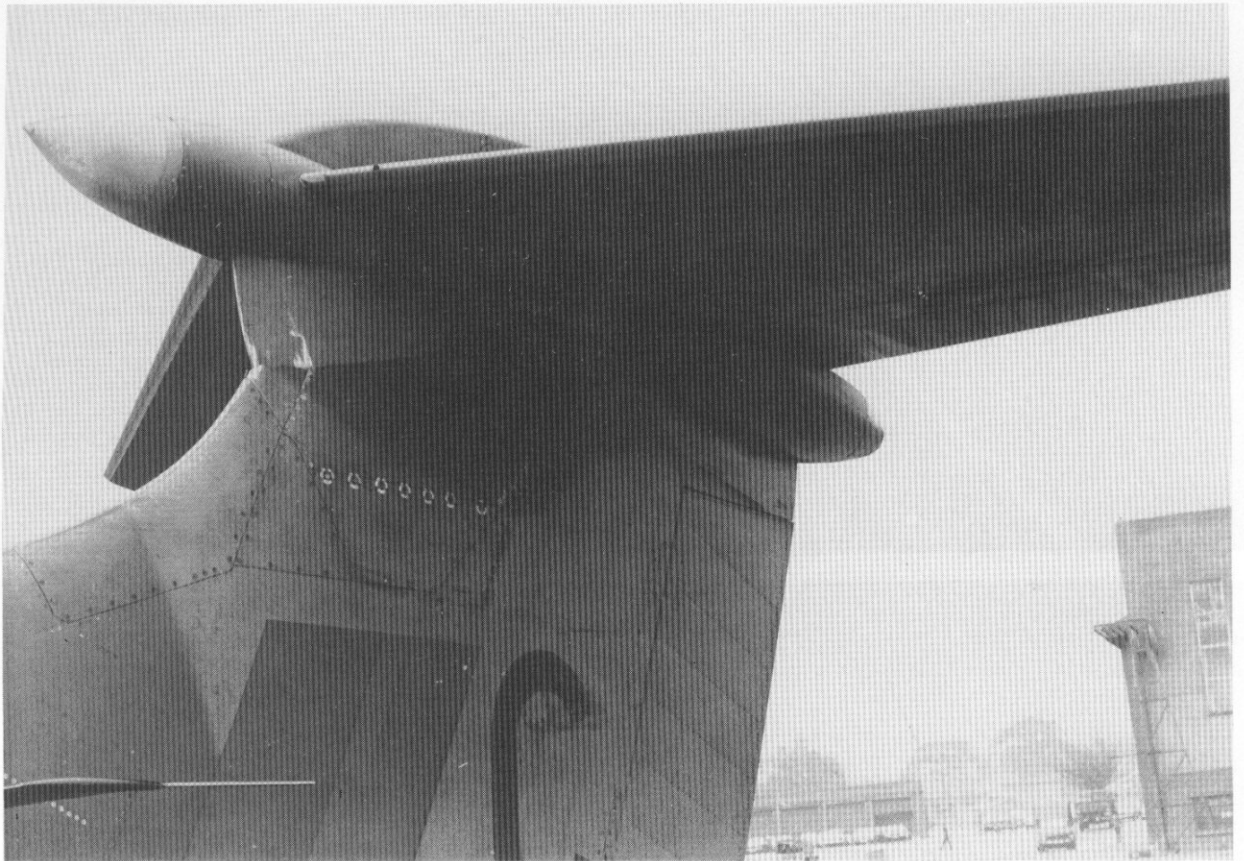
Bottom right: Starboard flap.

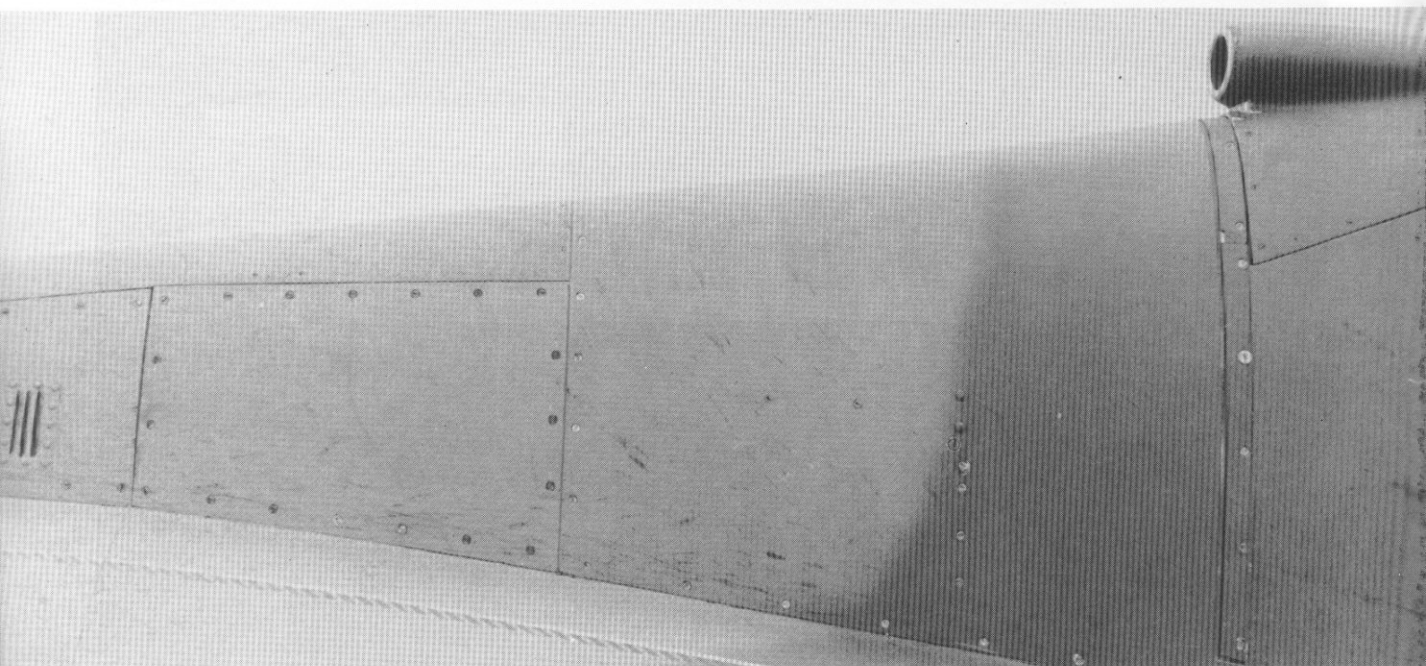
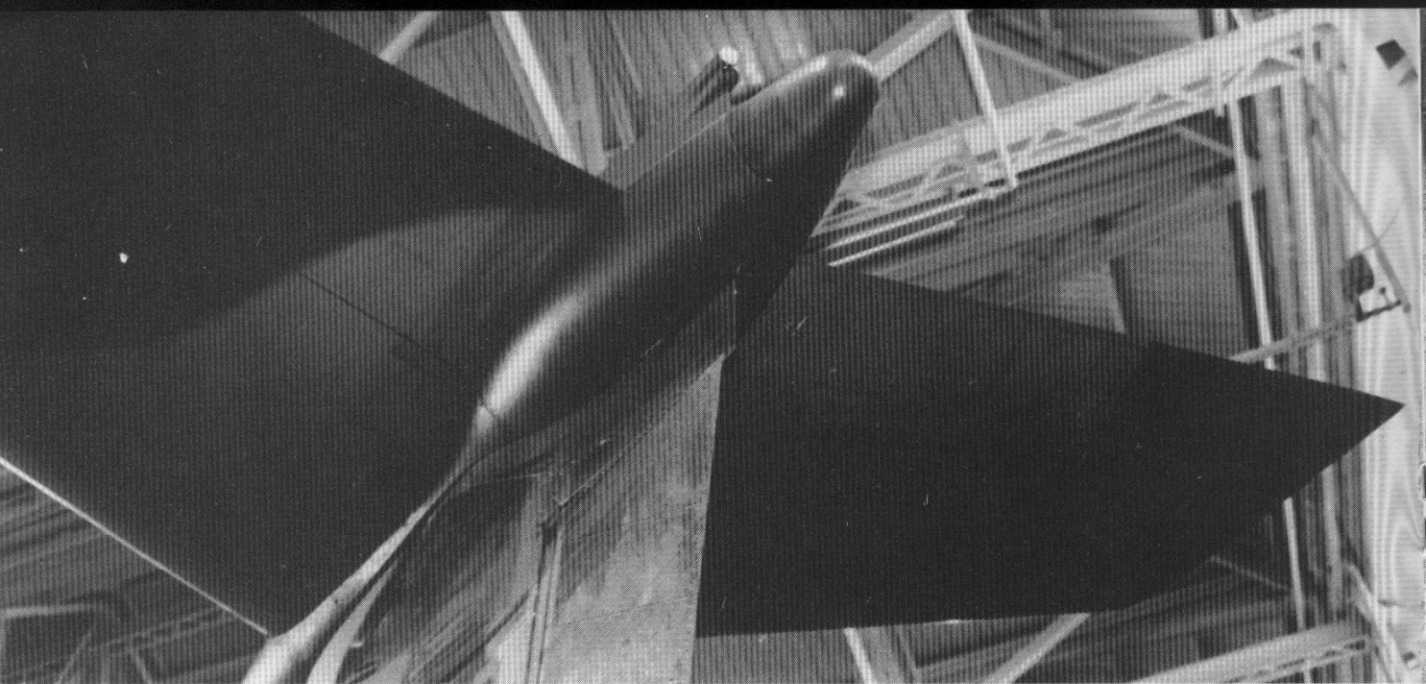
Opposite page top: Buccaneer

tailplane is all-moving but also has trailing edge flaps for additional control and boundary layer system similar to wings. 'Bullet' fairings house RWR antennas.

Opposite page bottom: Starboard side of fin of a No 237 OCU aircraft.







Top: Rear view of tailplane. Note oil streaking (probably from actuator mechanism) along fin.

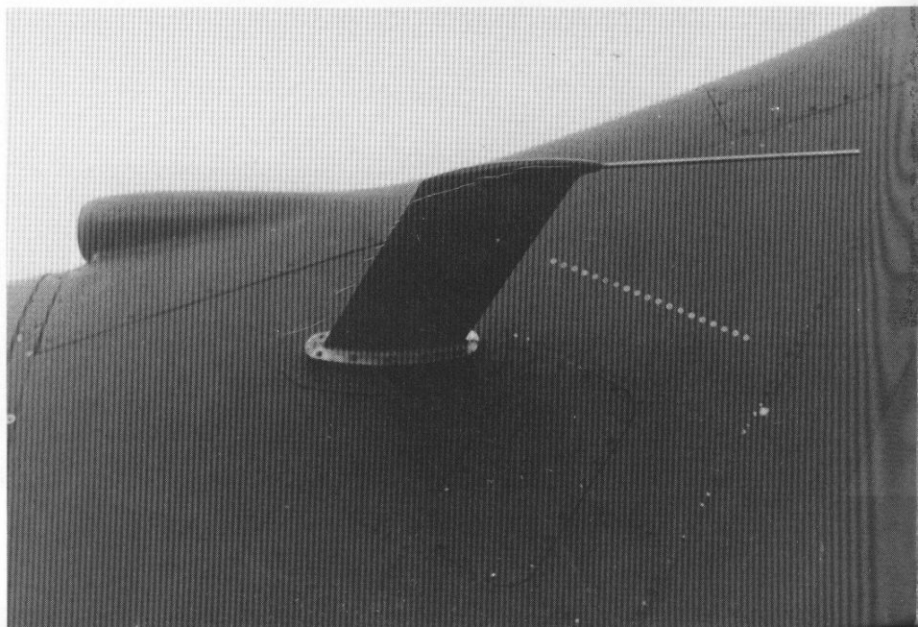
Above: Intake on fin leading edge admits ram air to cool equipment bay in fuselage below. Panel immediately in front is an HF notch antenna.

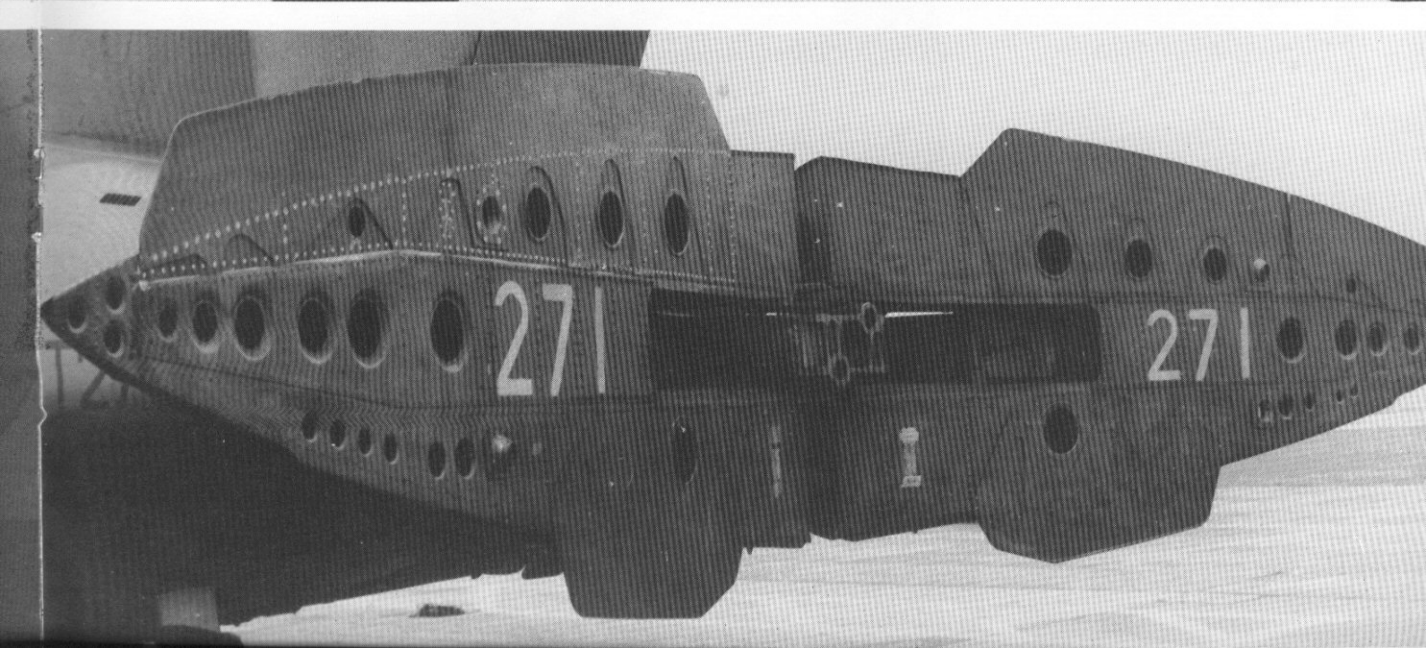
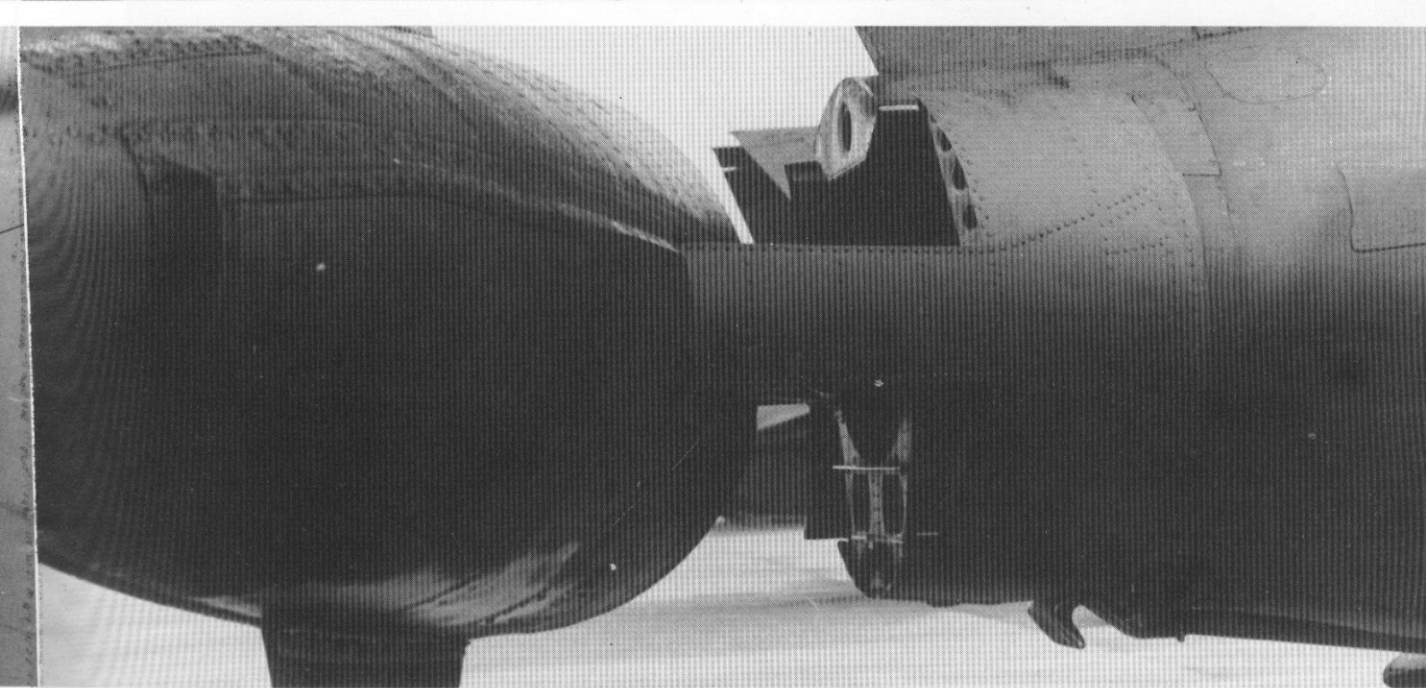
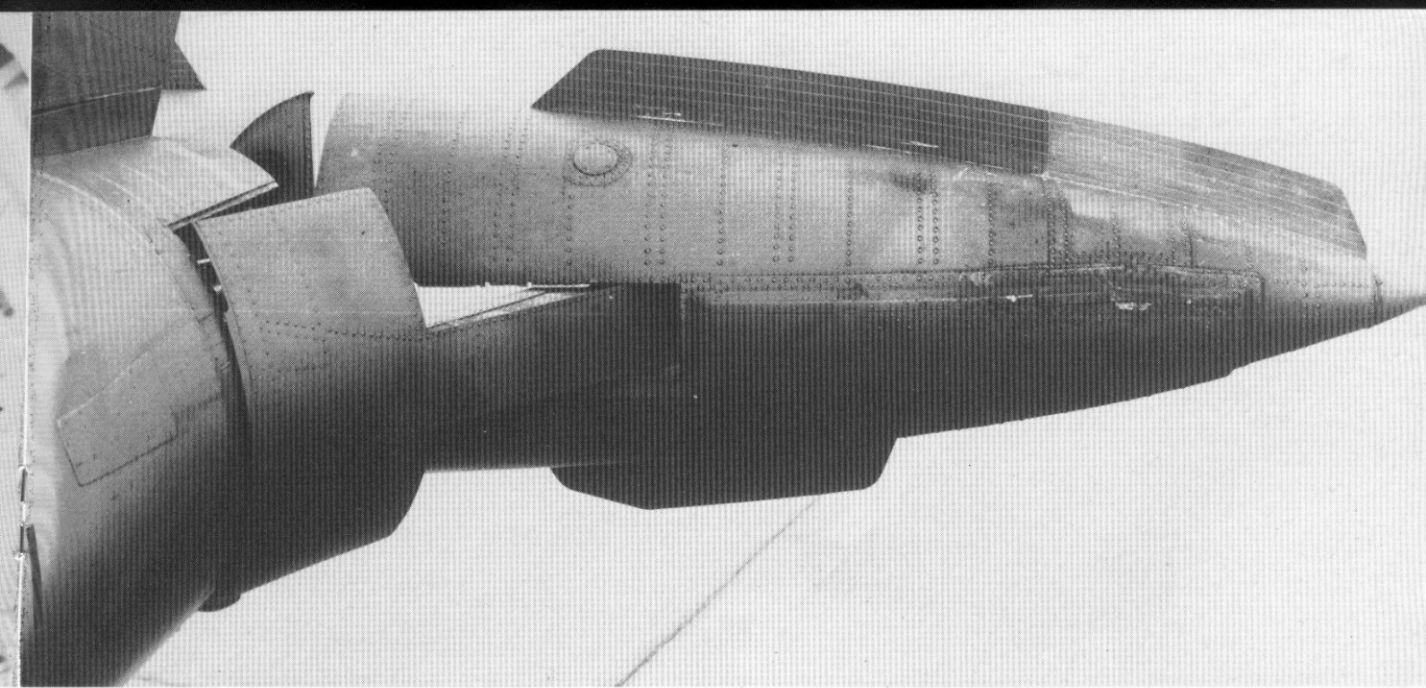
Right: Fin antenna (both sides); these were not fitted to RN or SAAF Buccaneers.

Opposite page top: Clamshell-type air brakes fitted to extreme rear of fuselage assist deceleration, especially during landings; strakes above and below aid aerodynamics.

Opposite page middle: Close-up of air brake hinge line, starboard side.

Opposite page bottom: S Mk 2 XT271 (No 237 OCU) reveals its identity on air brake inside surfaces.





UNDERCARRIAGE

Below: Buccaneer undercarriage is of the levered suspension variety.

Nosewheel, shown here, is steerable.

Note landing lamp at top of leg.

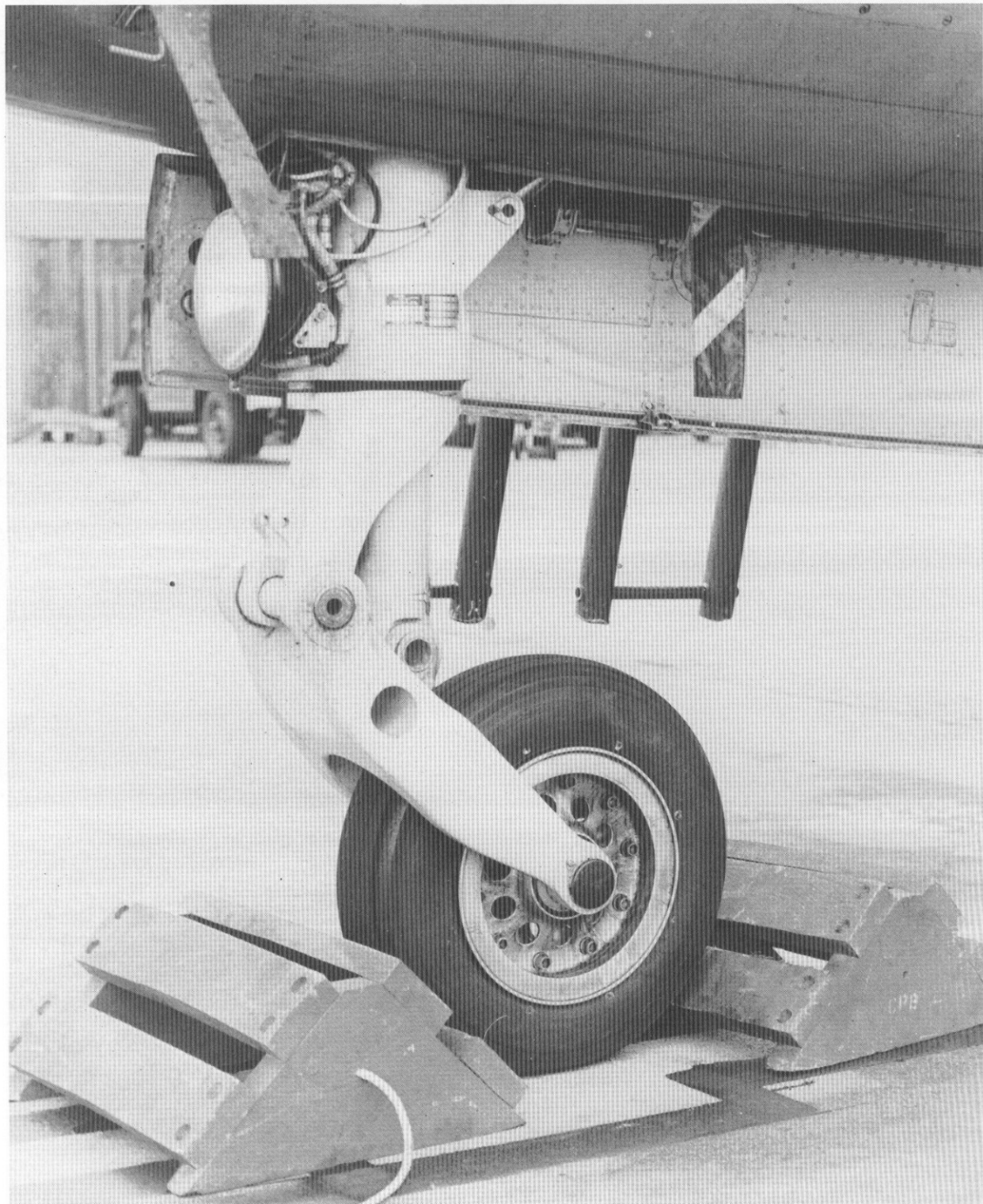
Opposite page top left: Port main gear leg, viewed from forward. Each

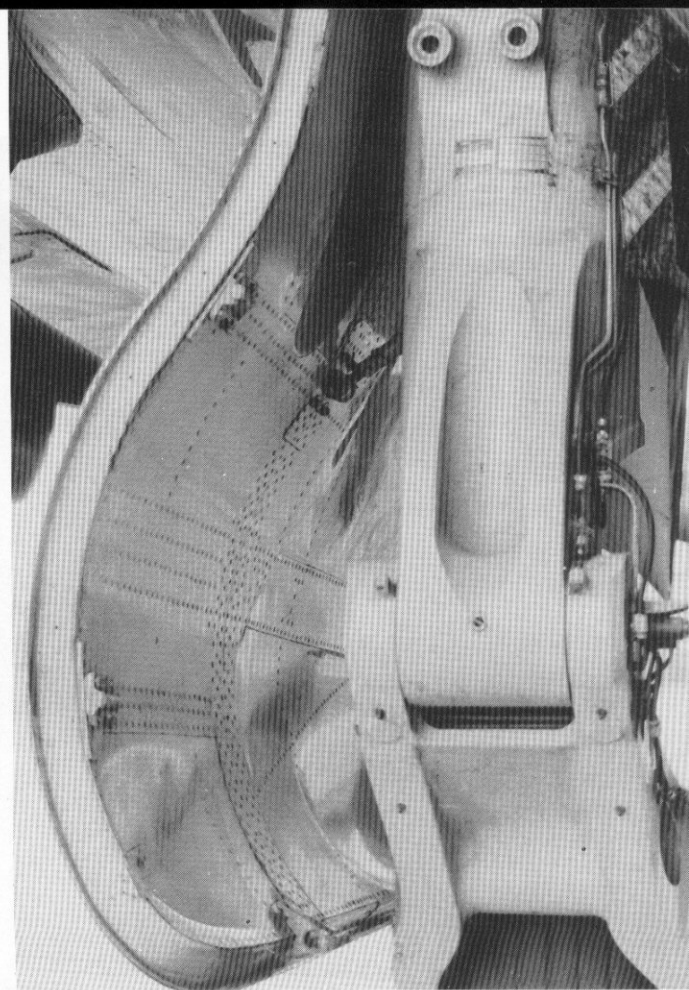
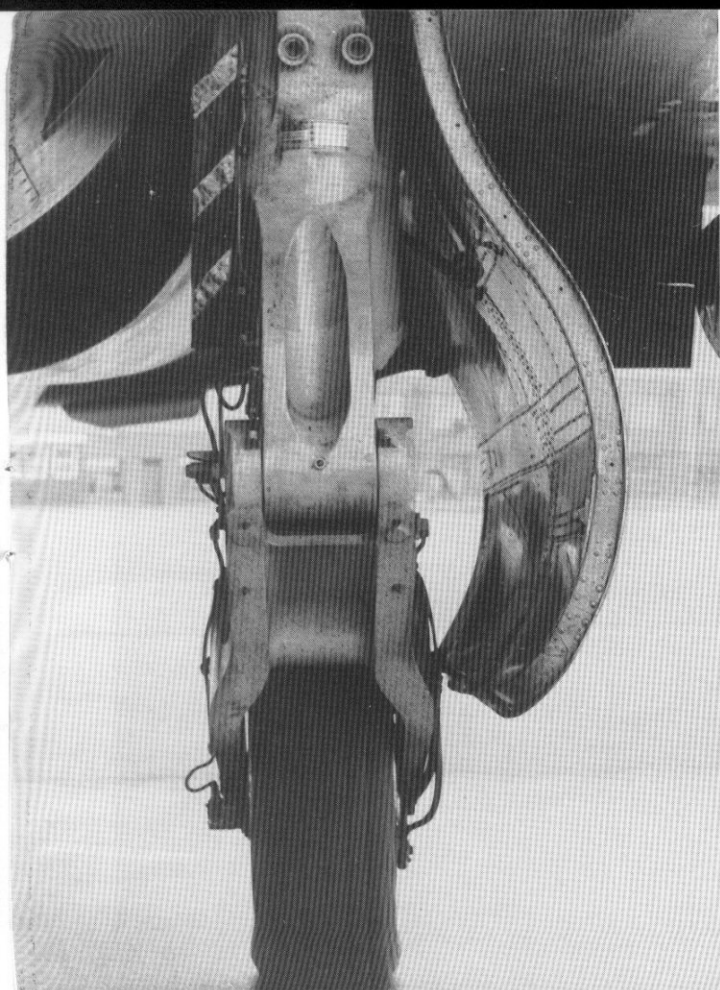
undercarriage bay needs only one door.

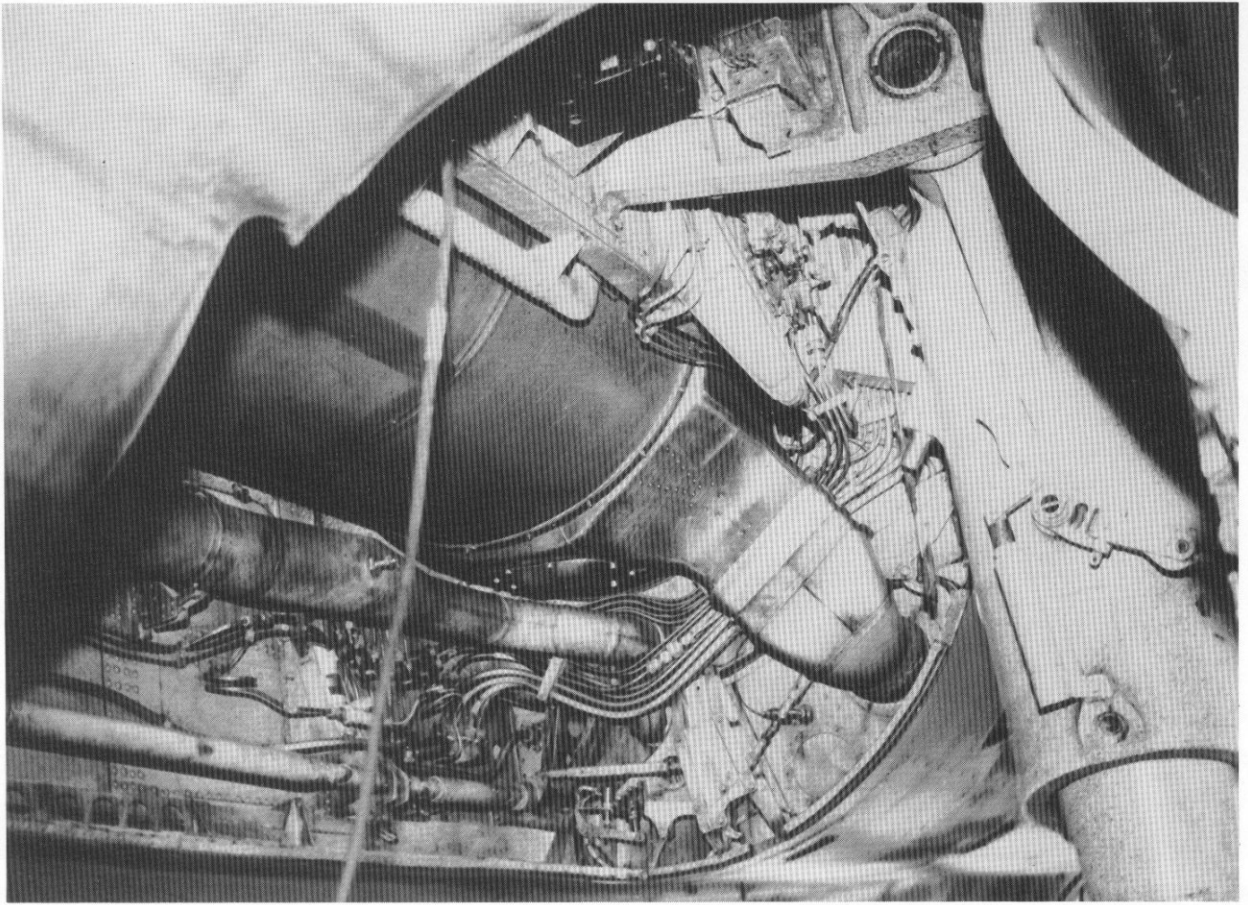
Opposite page top right: Detail of starboard main leg and door, showing hydraulic lines etc and door latches.

Opposite page bottom: Rear view of starboard main leg and door. The

Buccaneer's undercarriage is, as this view suggests, incredibly strong and of relatively simple design, although the wheels 'tuck up' behind the legs during retraction to provide compact stowage. Note door attachment strut.





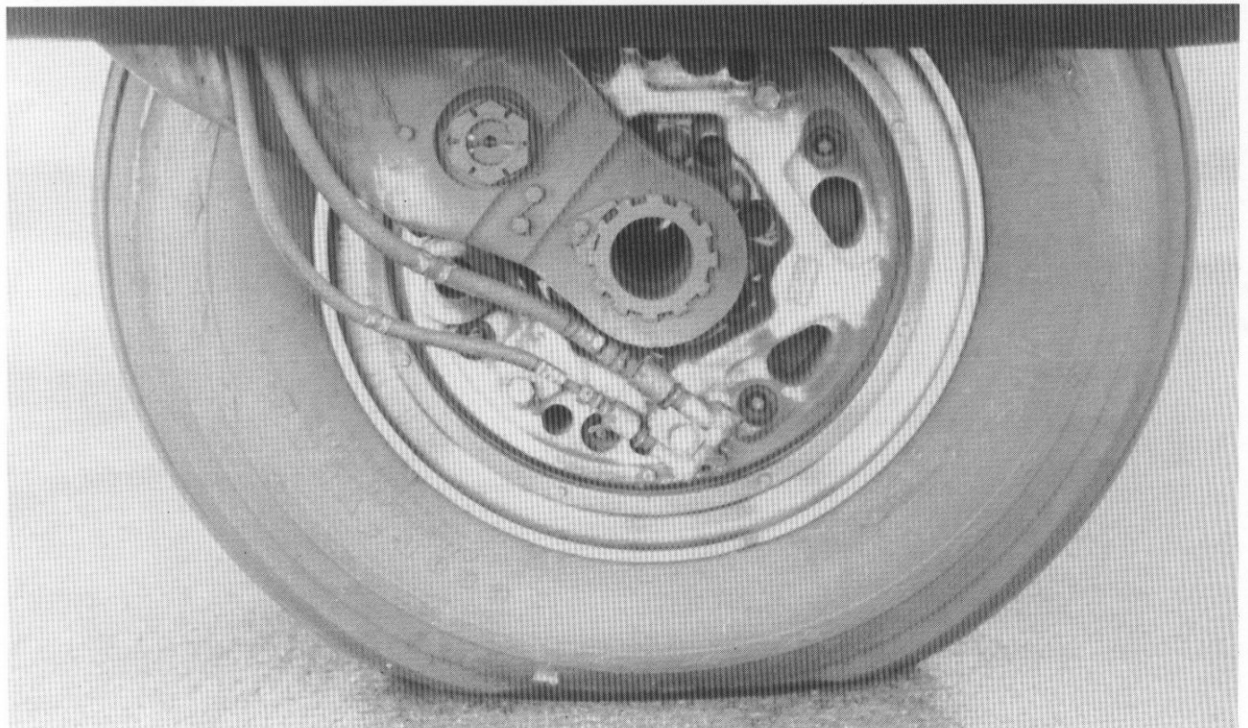


Above: A glimpse into the starboard mainwheel bay. The cylindrical casing at the top of the bay is the jetpipe to the

rear of the starboard Spey powerplant; the large duct immediately below it feeds boundary layer air aft. General

finish is Light Aircraft Grey.

Below: Outboard view of port mainwheel. Note that the axle is hollow.

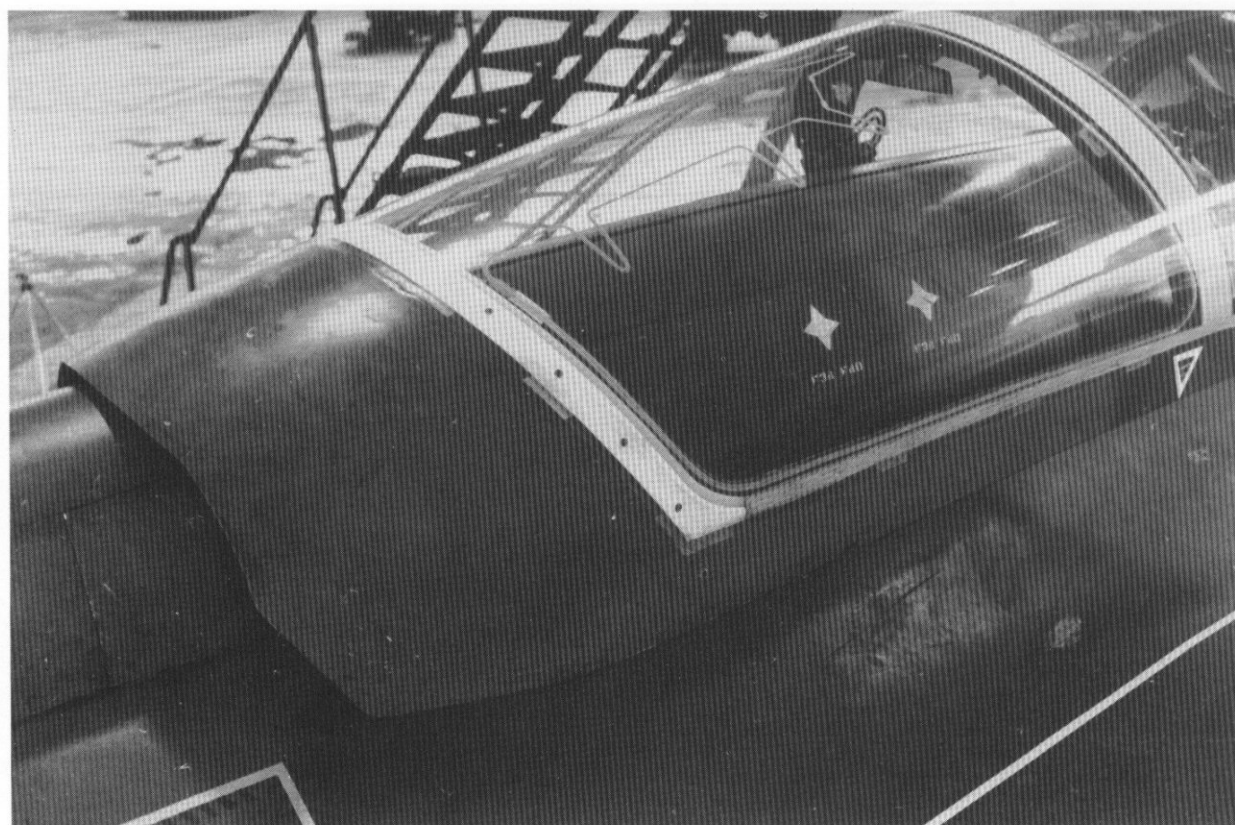
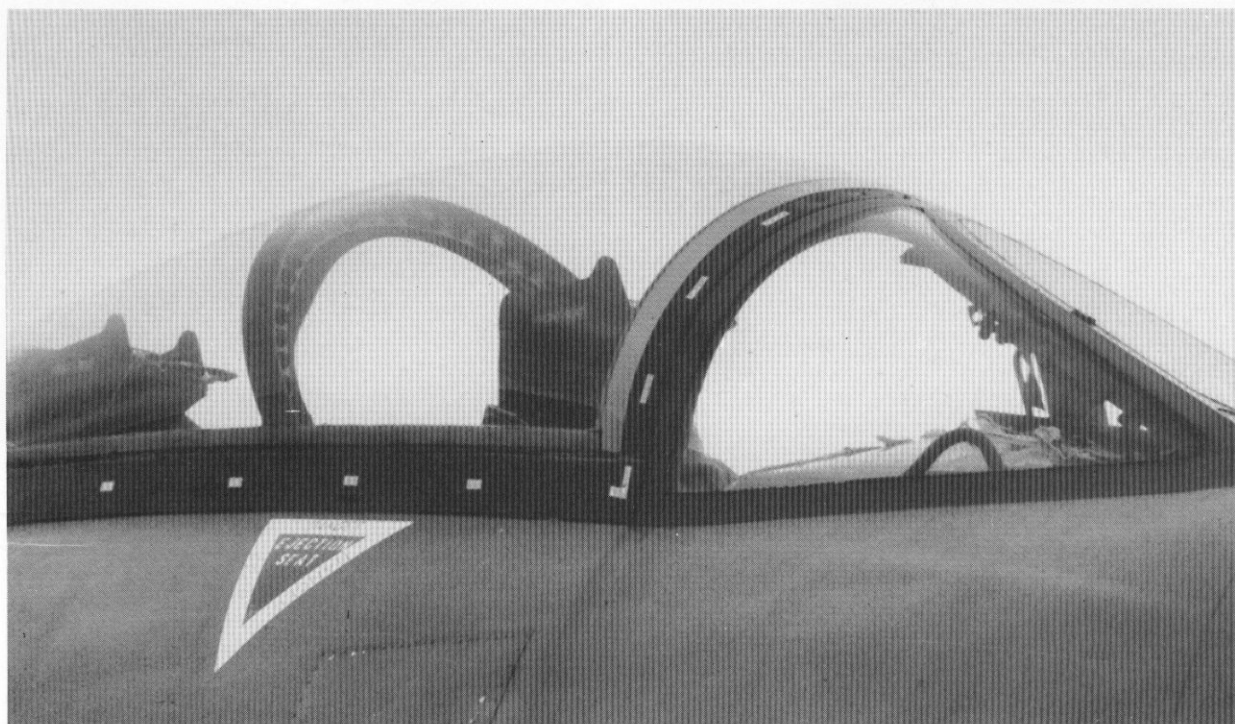


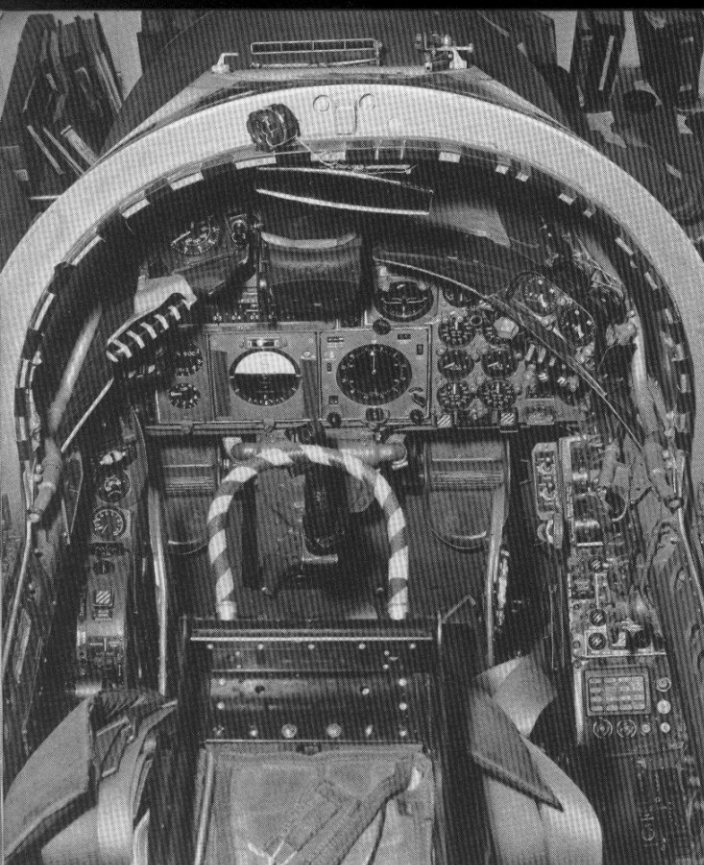
COCKPIT

Below: The Buccaneer requires a crew of two – pilot and navigator ('observer' in RN aircraft) – and the cockpit is enclosed by a two-piece canopy

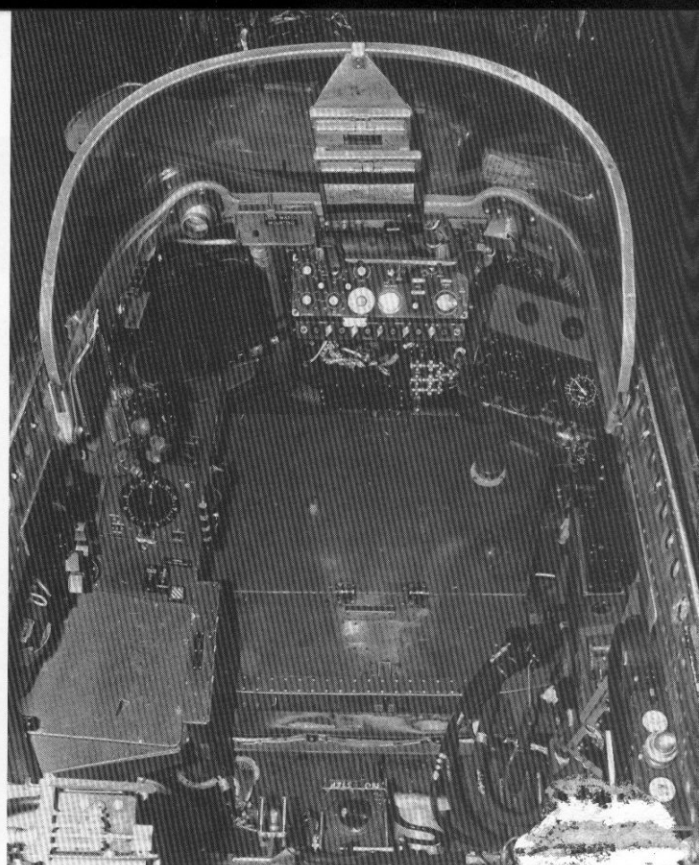
comprising windscreen and rearward-sliding hood; the latter features prominent, buff-coloured sealing strips.

Bottom: Rear half of canopy. Miniature Detonating Cord (MDC), to shatter canopy prior to emergency ejection, is visible.





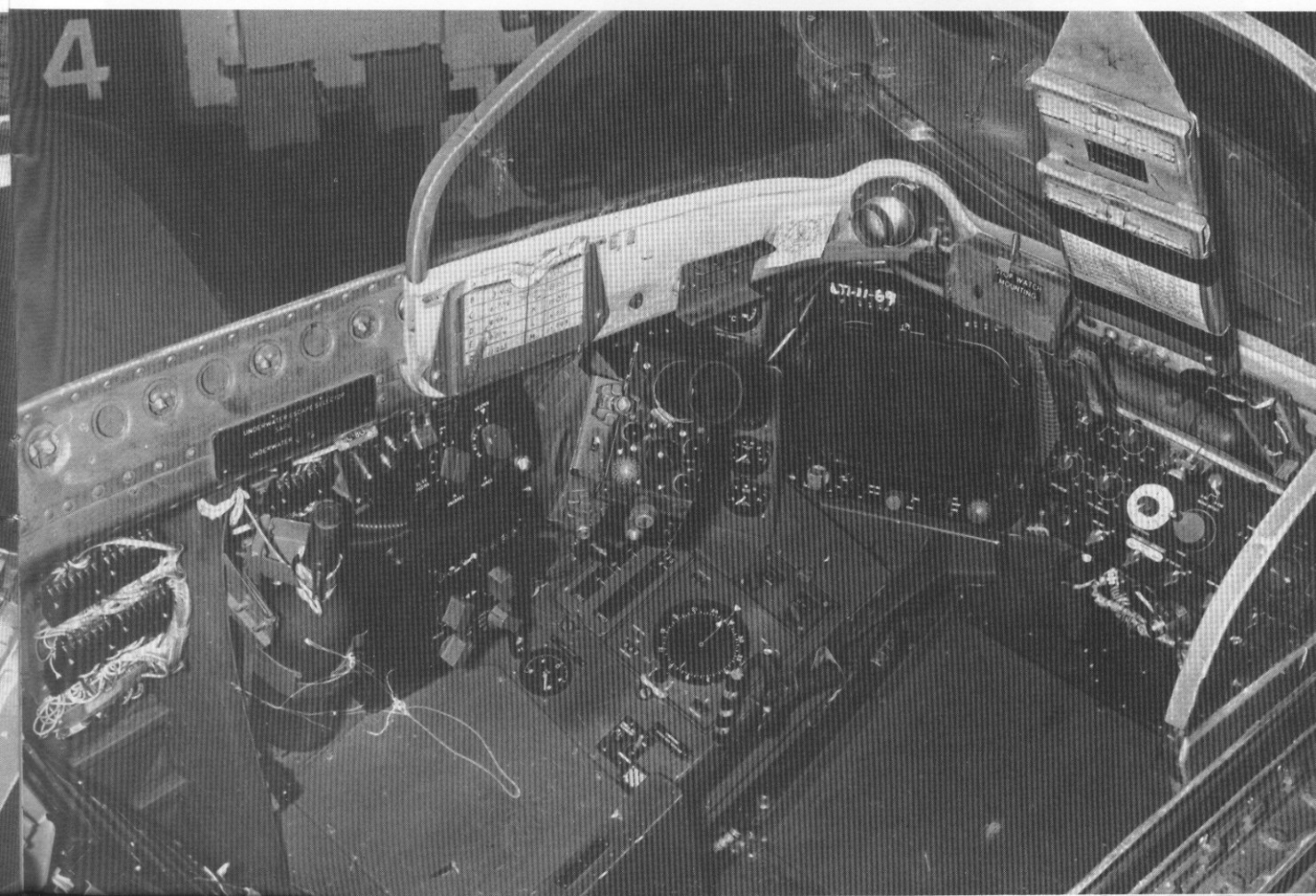
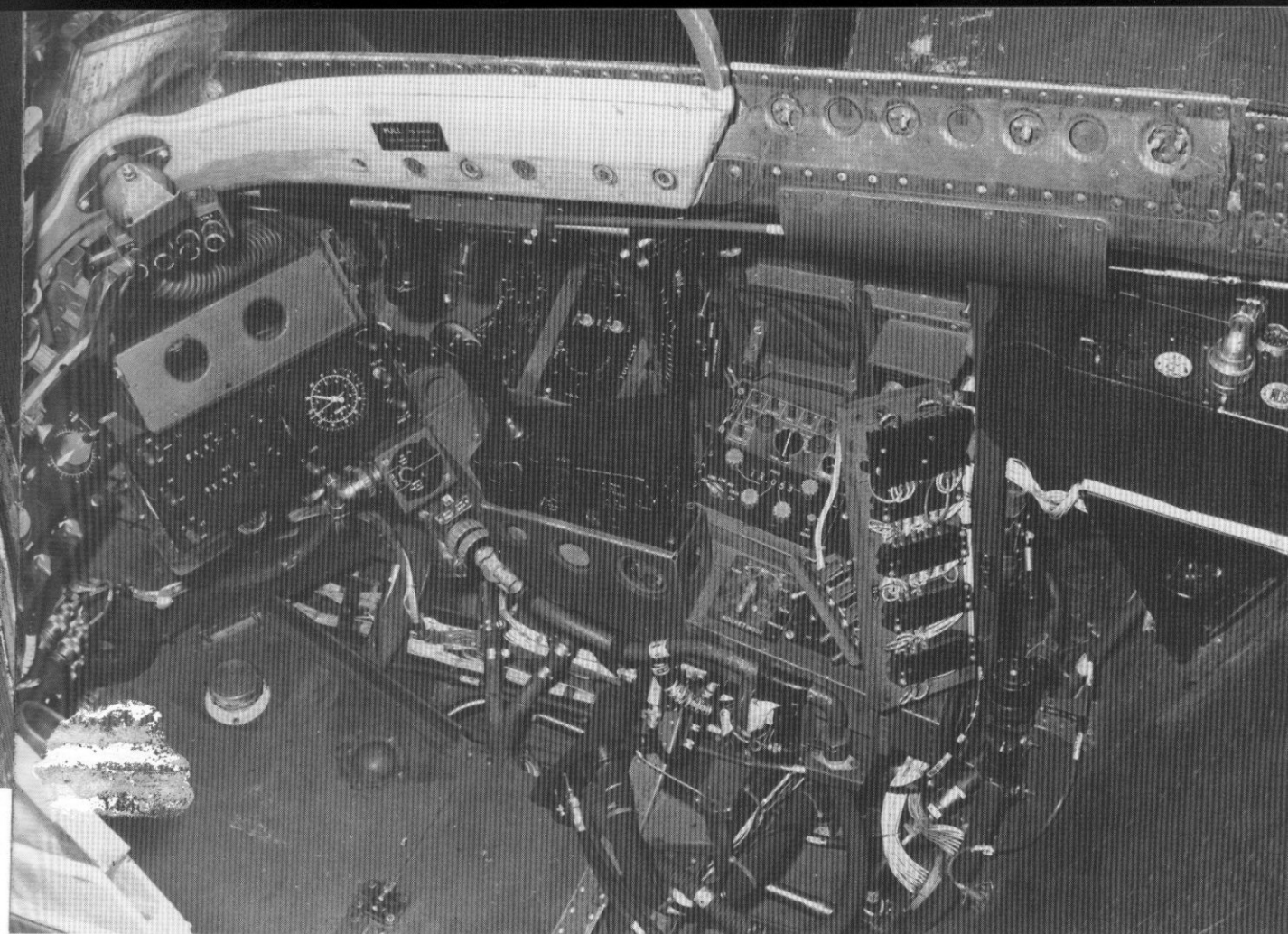
Above left: Pilot's cockpit, Buccaneer S Mk 2. The seat (which has the early 'D'-type ejection handle) is offset to port; that of the observer/navigator is offset to starboard. *HMS Heron*
Above right: Observer's cockpit (Fleet



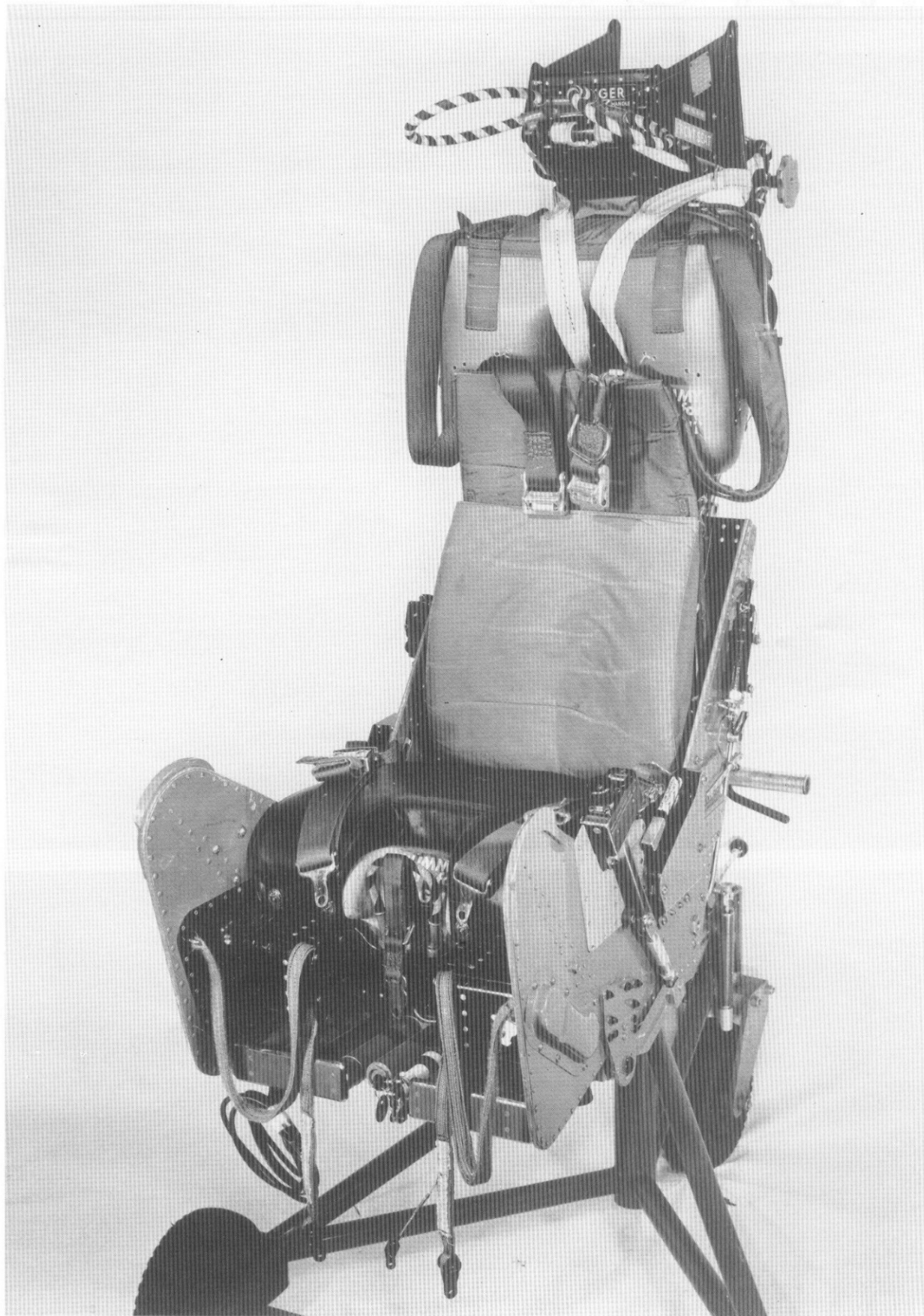
Air Arm S Mk 2). HMS Heron
Below: FAA personnel inspect the rear cockpit of an S Mk 2. *HMS Heron*
Opposite page: Two views of the rear crew position, the internal blast screen and Blue Parrot radar display clearly

visible. *HMS Heron*
Overleaf: Two photos showing the Buccaneer's Type 6MSB ejection seat, with current 'B'-type firing handle but now-obsolete torso harness connection. *Martin-Baker Aircraft Co Ltd*









WEAPONS & STORES

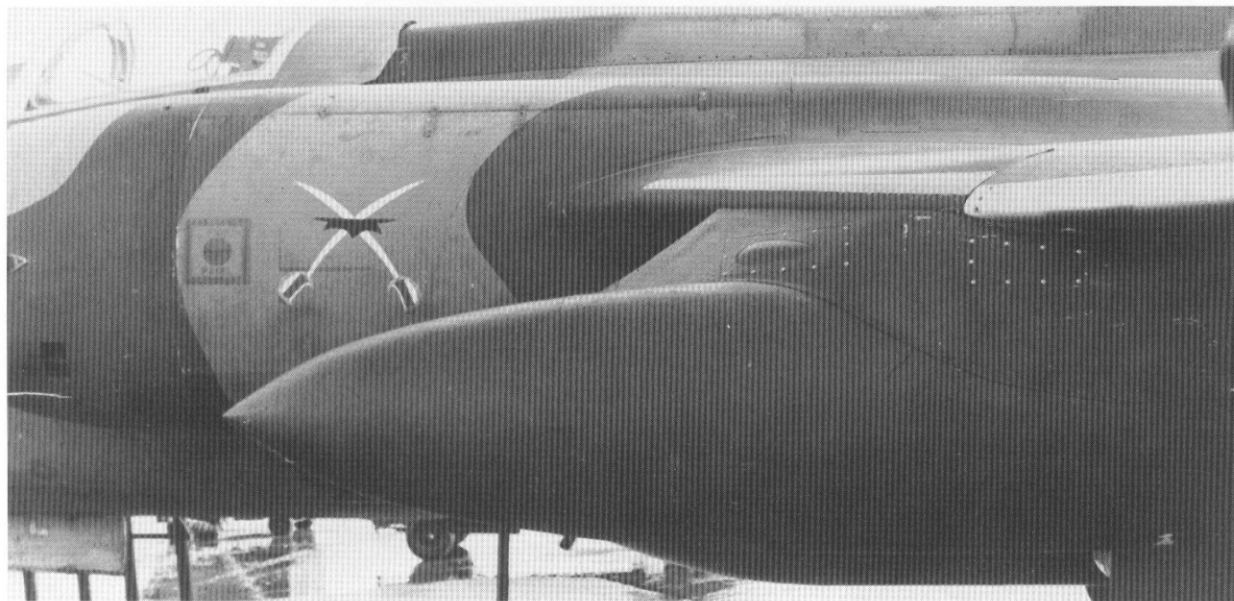
Below: A No 208 Sqn Buccaneer on deployment to Cyprus during the 1983 Lebanon Crisis, carrying a pair of Paveway laser-guided bombs (LGBs) on the inboard pylons (though, evidently, not the associated target designator), an ALQ-101 ECM pod on the starboard outer pylon and a Sidewinder air-to-air missile on the port outer. *Sqn Ldr Rudd*

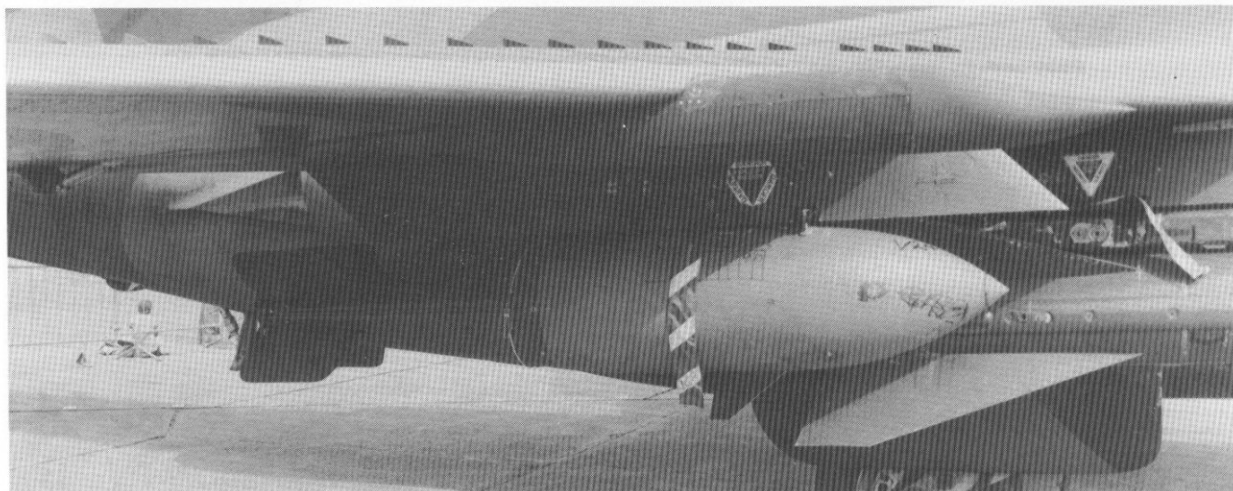
Bottom: The Buccaneer's unique, faired-in 430gal 'slipper' tank endows the aircraft with even greater unrefuelled range.

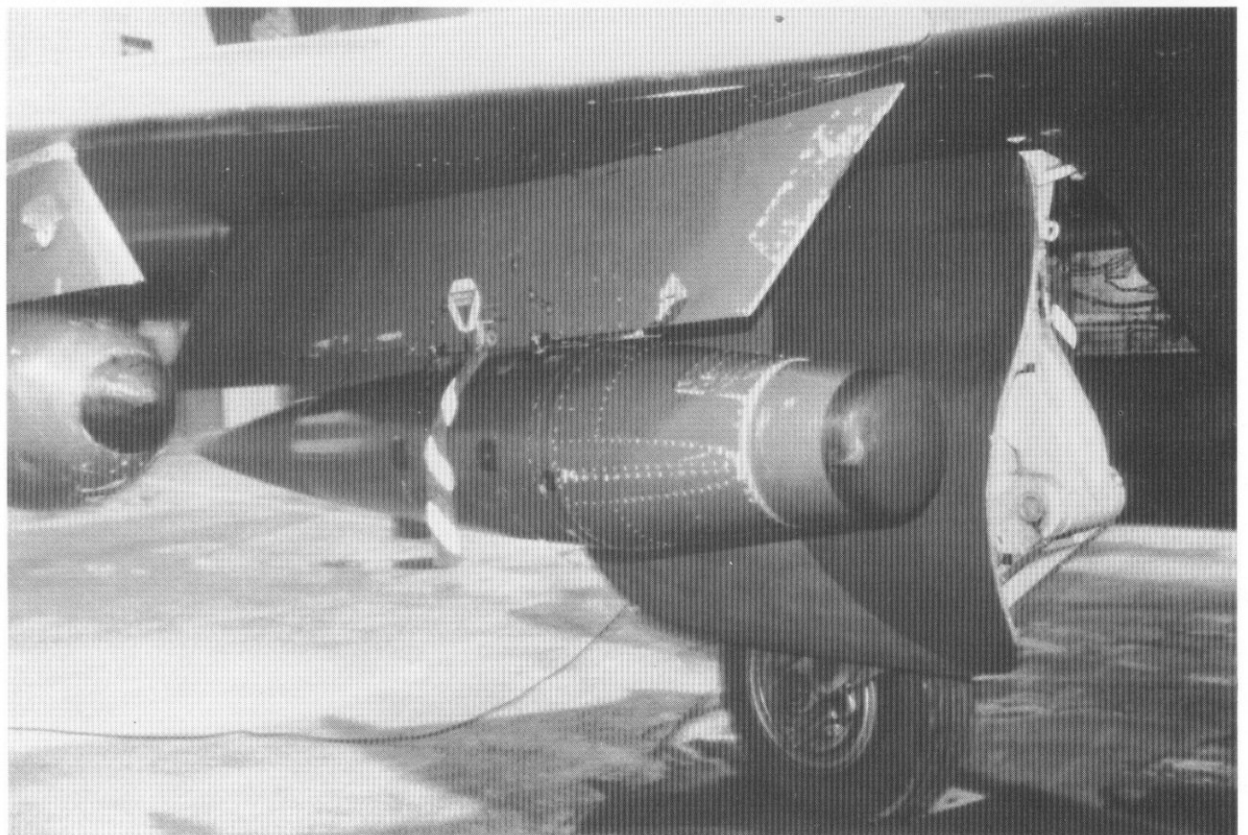
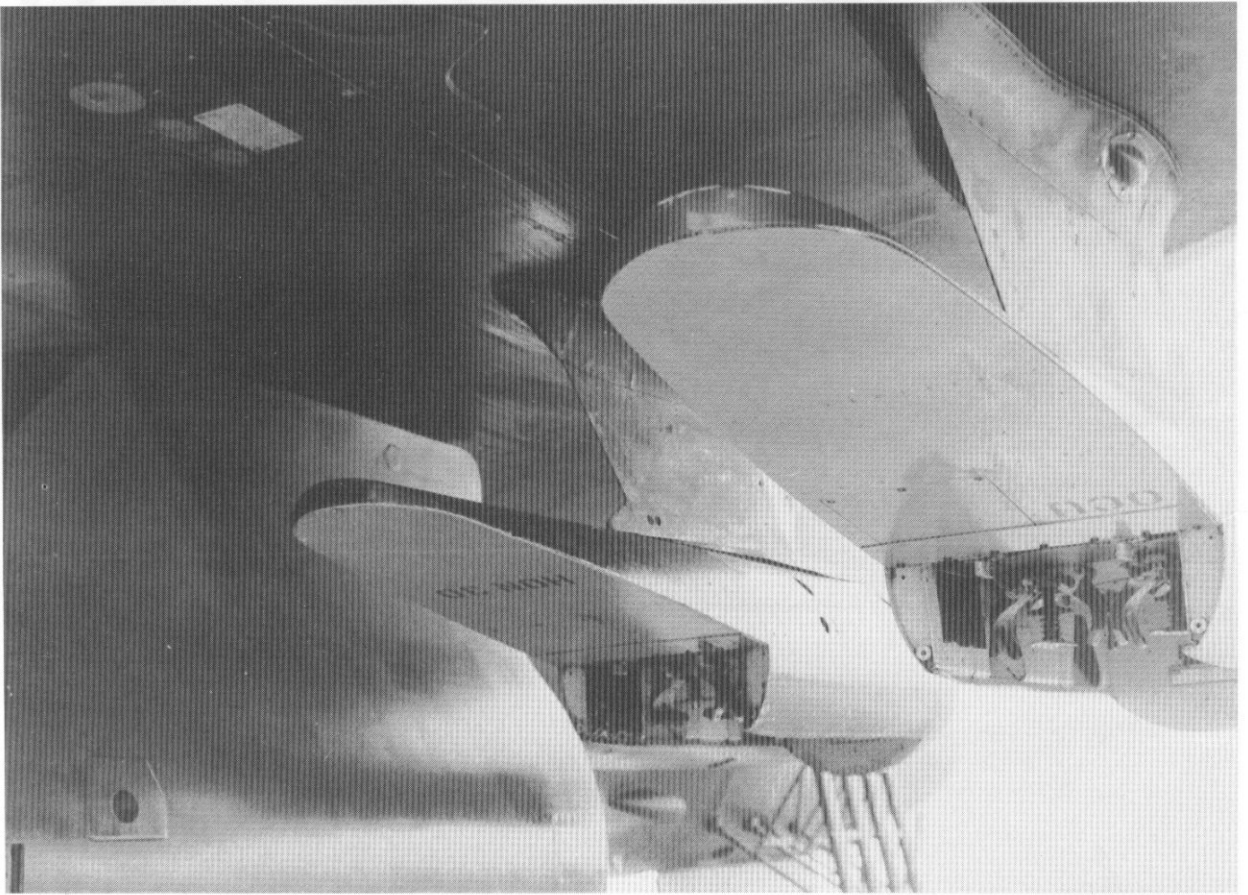
Opposite page top: A No 12 Sqn S Mk 2B displays its Martel air-to-surface missile. This anti-shiping weapon is available in two configurations, anti-radar (shown) or TV-guided.

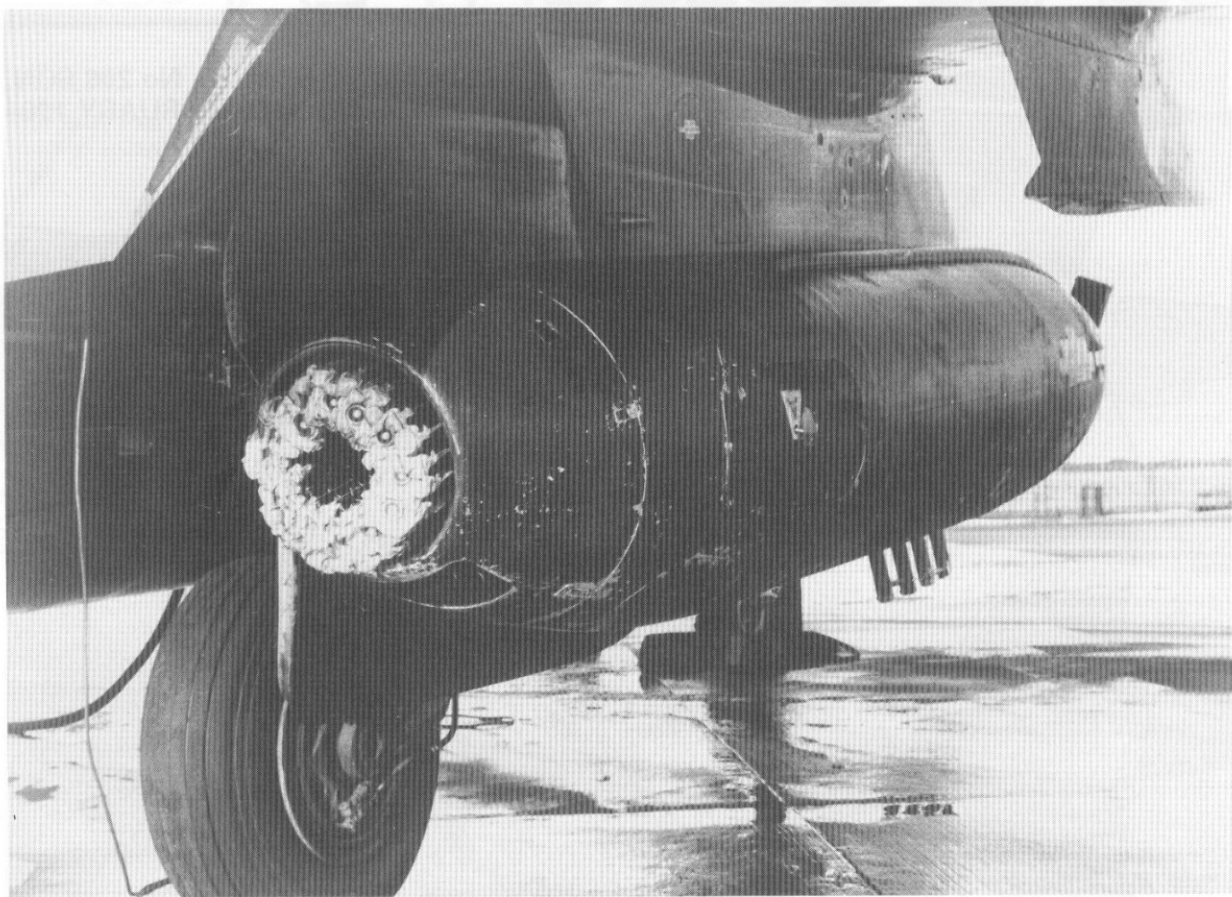
Opposite page middle: A 1000lb 'iron' bomb hangs from the starboard outer pylon of a No 12 Sqn Buccaneer; inboard is a Martel. *Richard L Ward*

Opposite page bottom: Westinghouse ALQ-101 electronic countermeasures (ECM) pod, though now dated, can help jam hostile radar transmissions. Note radar warning receiver (RWR) fairing.





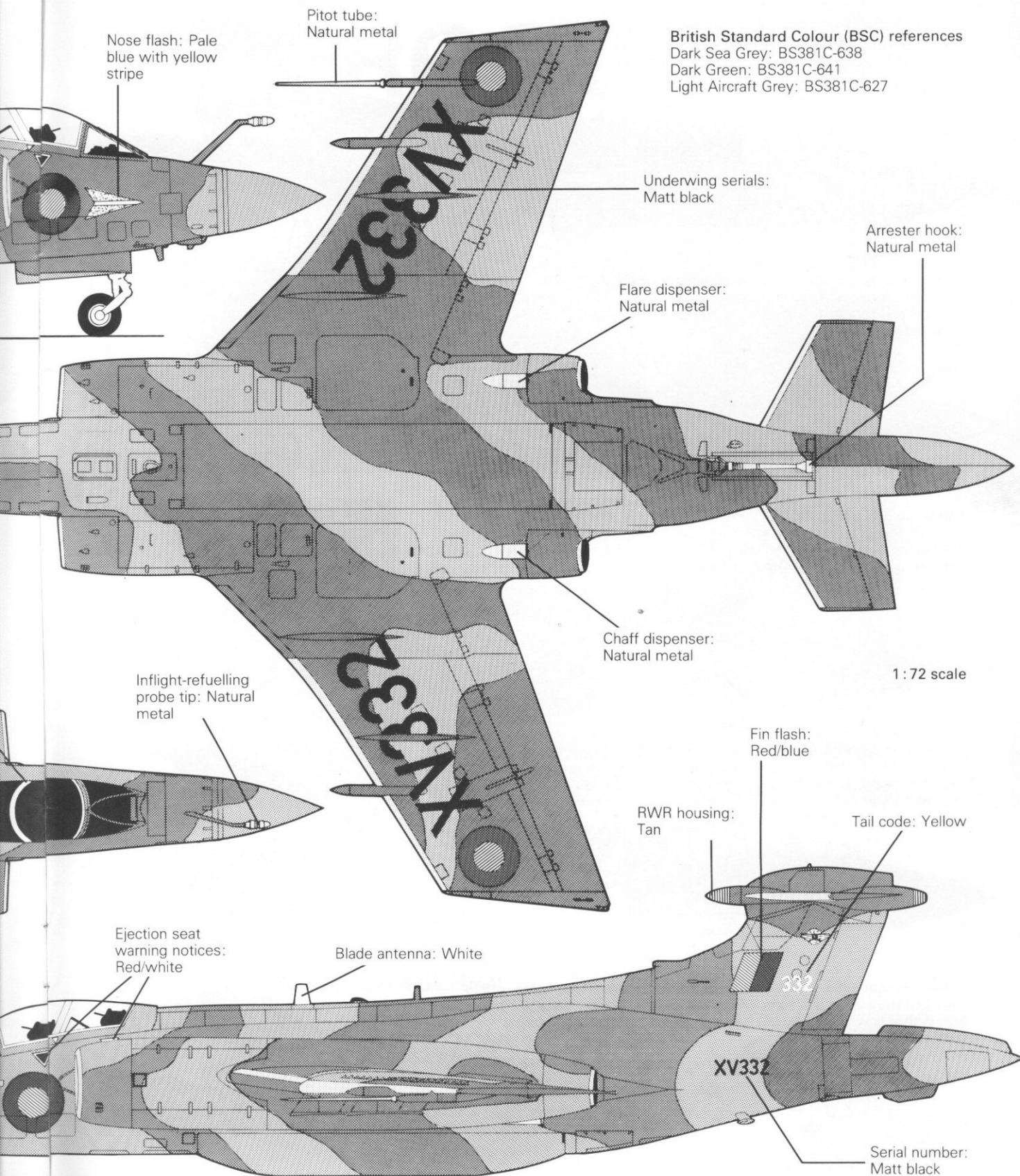




Opposite page top: CBLS practice bomb dispensers fitted to a No 237 OCU Buccaneer S Mk 2A. Note faired pylons, closer together than on Martel-compatible S Mk 2Bs.

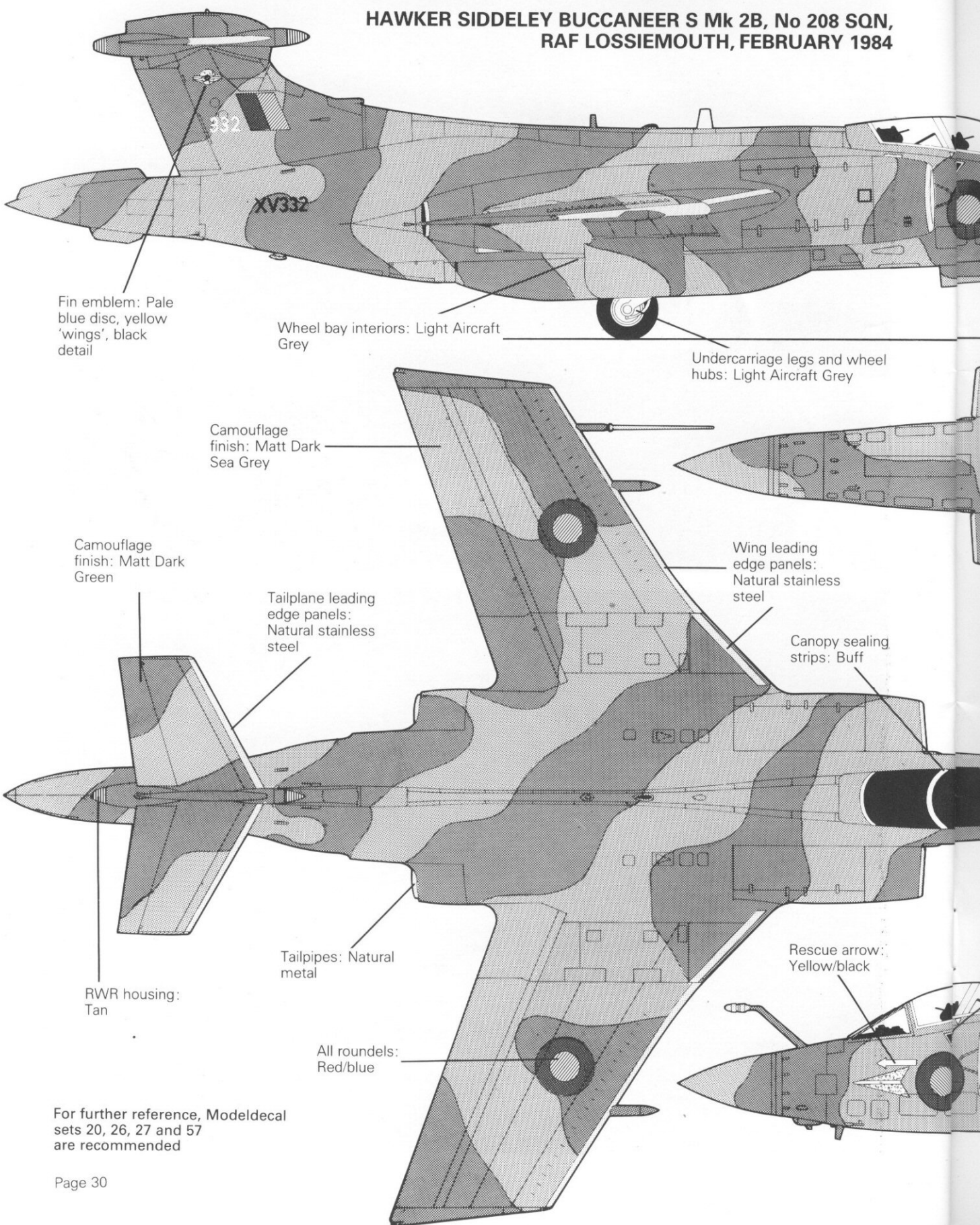
Opposite page bottom: Data link pod on inboard station, mounted below special 'reversed' pylon.
Top: Buccaneers can act as 'buddy' tankers when equipped with the Mk 20

Hose Drogue Unit (HDU). The HDU has its own 145gal tank, which can be replenished continually from the aircraft's fuel system in flight.
Above: Nose of HDU.



SCALE COLOUR PLANS

**HAWKER SIDDELEY BUCCANEER S Mk 2B, No 208 SQN,
RAF LOSSIEMOUTH, FEBRUARY 1984**



Fin emblem: Pale blue disc, yellow 'wings', black detail

Wheel bay interiors: Light Aircraft Grey

Undercarriage legs and wheel hubs: Light Aircraft Grey

Camouflage finish: Matt Dark Sea Grey

Camouflage finish: Matt Dark Green

Tailplane leading edge panels: Natural stainless steel

Wing leading edge panels: Natural stainless steel

Canopy sealing strips: Buff

Tailpipes: Natural metal

RWR housing: Tan

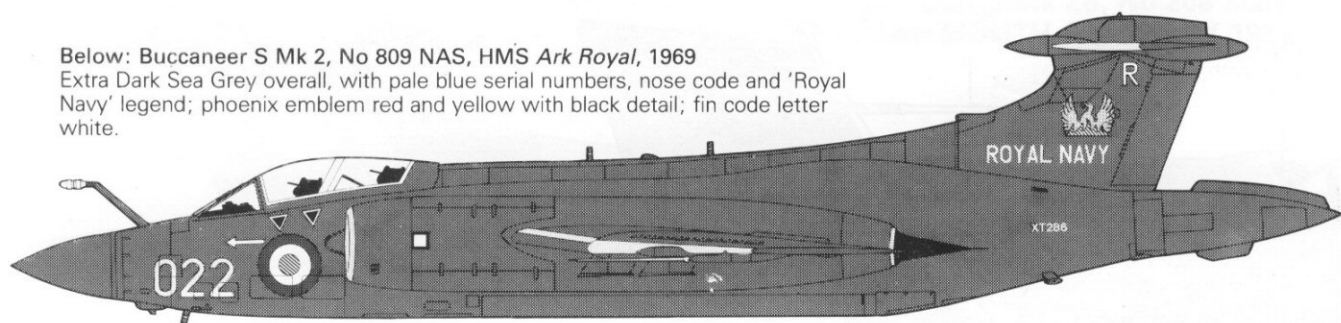
Rescue arrow: Yellow/black

All roundels: Red/blue

For further reference, Modeldecals sets 20, 26, 27 and 57 are recommended

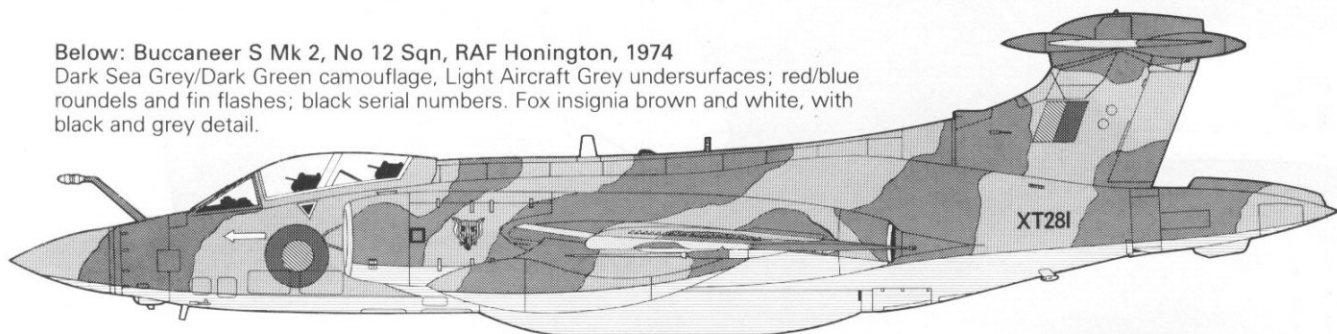
Below: Buccaneer S Mk 2, No 809 NAS, HMS Ark Royal, 1969

Extra Dark Sea Grey overall, with pale blue serial numbers, nose code and 'Royal Navy' legend; phoenix emblem red and yellow with black detail; fin code letter white.



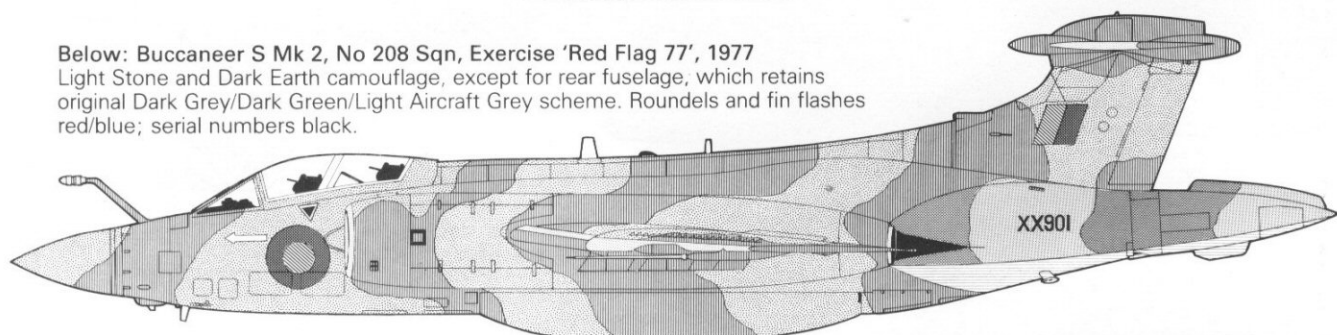
Below: Buccaneer S Mk 2, No 12 Sqn, RAF Honington, 1974

Dark Sea Grey/Dark Green camouflage, Light Aircraft Grey undersurfaces; red/blue roundels and fin flashes; black serial numbers. Fox insignia brown and white, with black and grey detail.



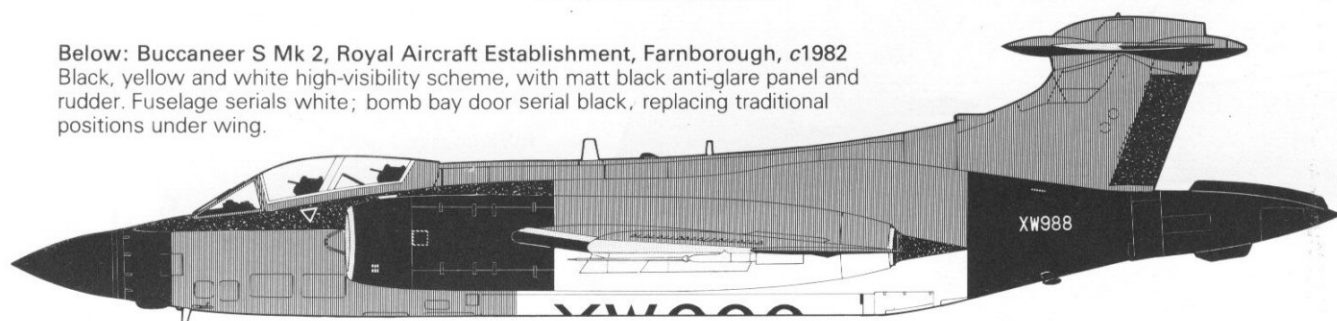
Below: Buccaneer S Mk 2, No 208 Sqn, Exercise 'Red Flag 77', 1977

Light Stone and Dark Earth camouflage, except for rear fuselage, which retains original Dark Grey/Dark Green/Light Aircraft Grey scheme. Roundels and fin flashes red/blue; serial numbers black.



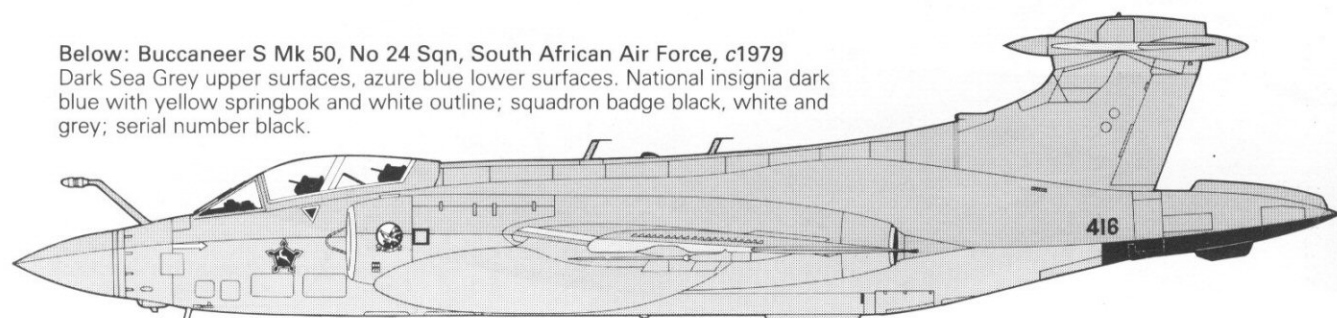
Below: Buccaneer S Mk 2, Royal Aircraft Establishment, Farnborough, c1982

Black, yellow and white high-visibility scheme, with matt black anti-glare panel and rudder. Fuselage serials white; bomb bay door serial black, replacing traditional positions under wing.

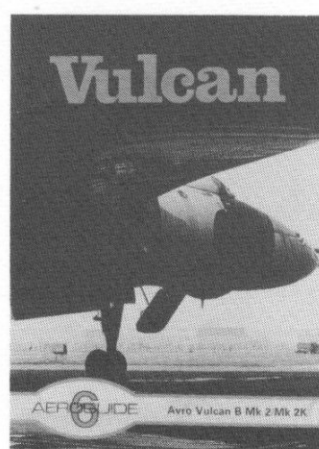
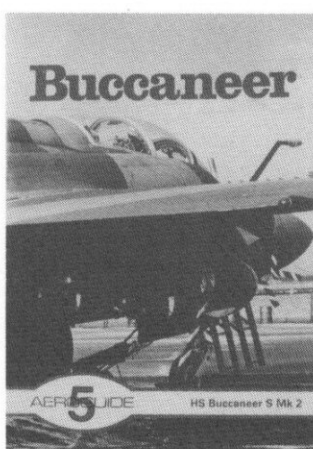
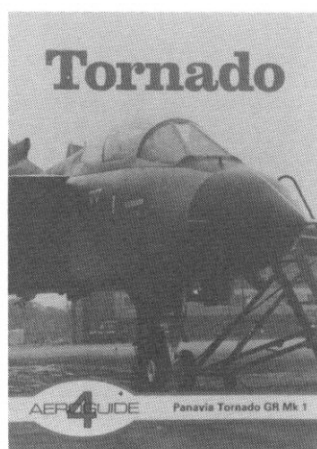
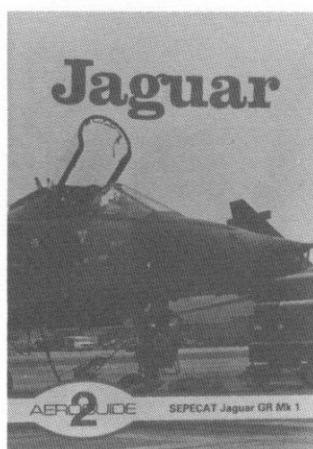
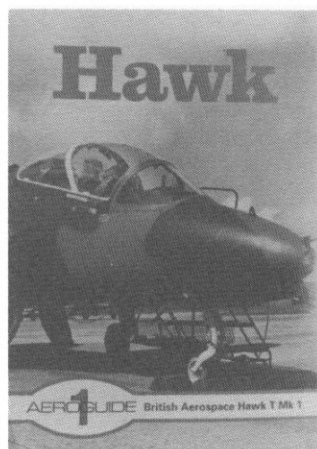


Below: Buccaneer S Mk 50, No 24 Sqn, South African Air Force, c1979

Dark Sea Grey upper surfaces, azure blue lower surfaces. National insignia dark blue with yellow springbok and white outline; squadron badge black, white and grey; serial number black.



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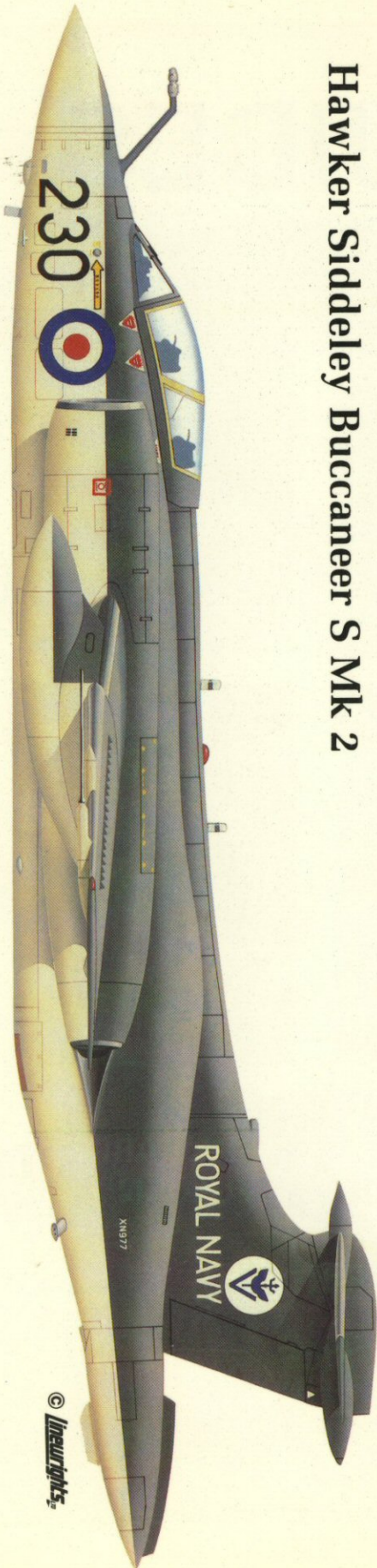


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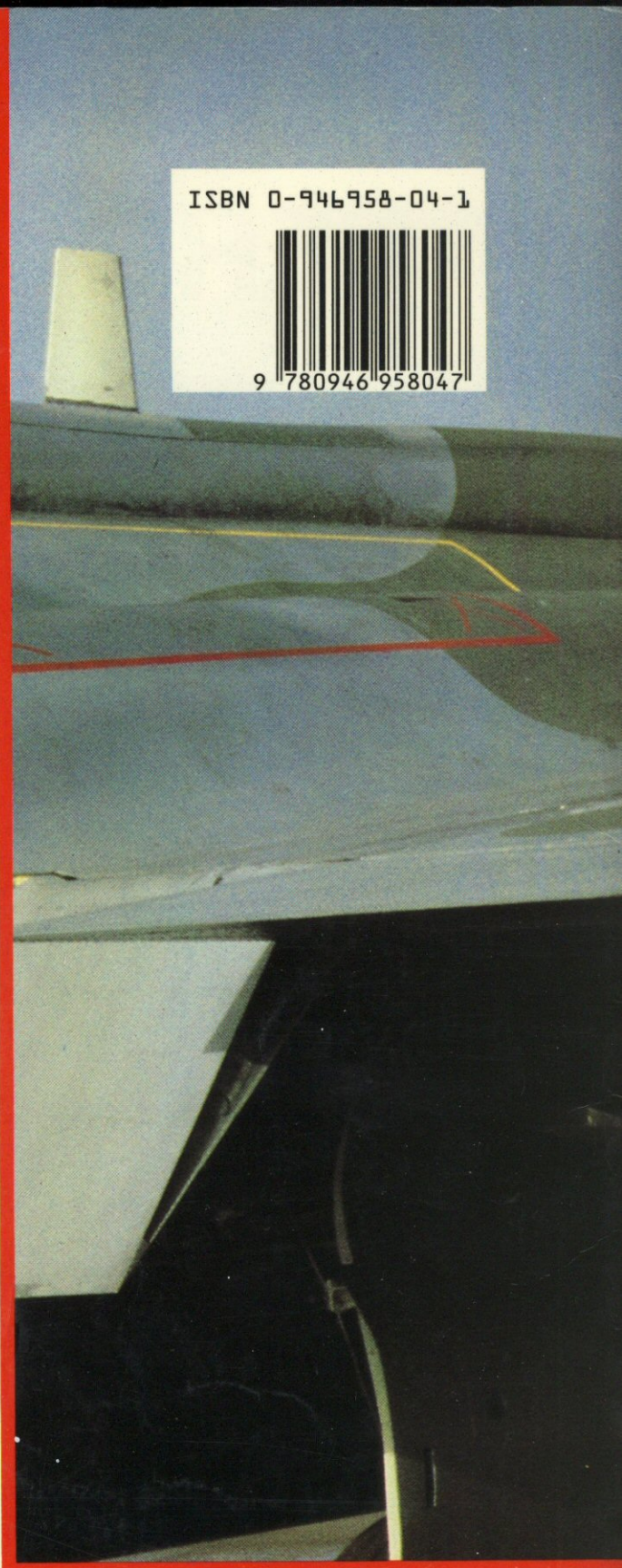


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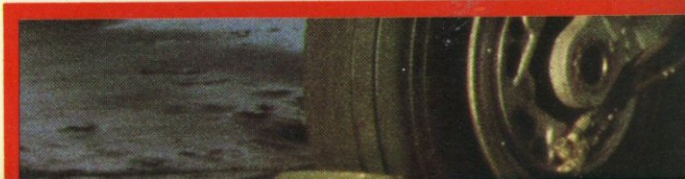


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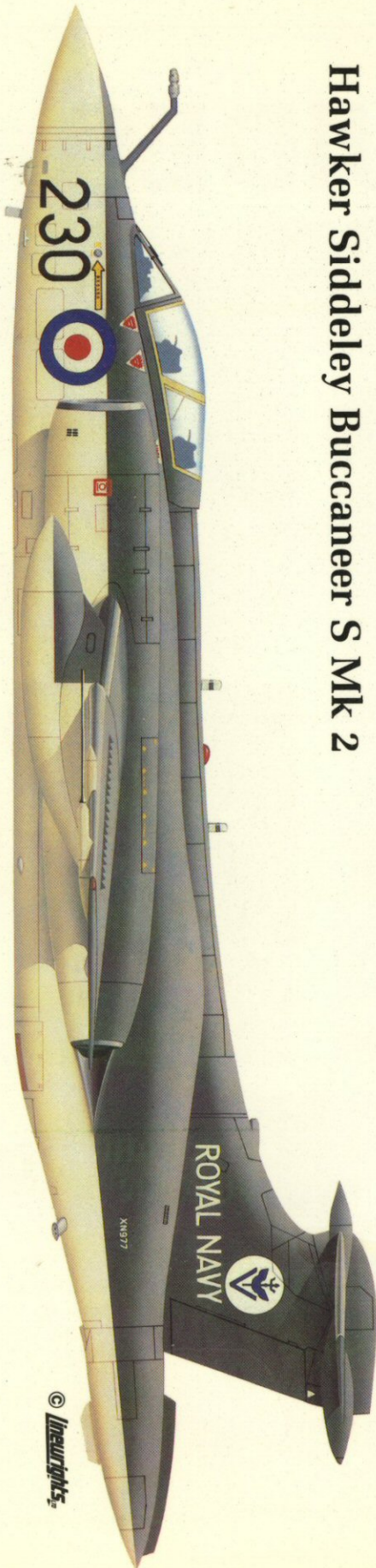


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